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# CONJUGATE INTERSECTS TO SELECTED GEOPHYSICAL STATIONS

by

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## SUMMARY

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Geomagnetic field lines are traced into space for more than 500 geophysical stations, using the 48-term Jensen and Cain field expansion for 1960. Total field intensity, magnetic dip, declination, and L-values are computed at each station, and at points 300 and 400 Km vertically above. Coordinates and B values of the conjugate intersects and of the equatorial (minimum B) points are determined for each field line, as well as the total arc length of the line between origin and conjugate intersect.

A general discussion of the resulting tables is given.

Finally, a series of maps showing constant B and L contours at various levels between surface and 3,000 Km are reproduced.

## FOREWORD

COSPAR's Panel on Conjugate Point Experiments was established in 1962 as a subgroup of Working Group 2, on the basis of a recommendation of the IQSY Working Group on Cosmic Rays and Geomagnetically Trapped Particles. Members of the Panel are: R. A. Helliwell, W. N. Hess, J. D. Kalinin, J. Paton, R. Schlich, R. L. O. Storey, and E. Vestine.

So far, the Panel's activities were mainly limited to keeping COSPAR informed about conjugate point experiments under course, to propose pertinent recommendations on cooperative programs and to discuss possibilities for future experiments.

At last, COSPAR's Panel on Conjugate Point Experiments has started to produce information for more general use. This was possible thanks to the most efficient cooperation of NASA's Goddard Space Flight Center, which is herewith duly acknowledged.

We believe the following tables may find wide use and may constitute the beginning of our Panel's activities as a service to the scientific community. Moreover, it is our sincere hope that these tables might serve to increment cooperation or to start new scientific ties between different countries – in this case "magnetically conjugate countries" –; a service which, after all, is the ultimate goal of all COSPAR Working Groups and Panels.

Juan G. Roederer
Chairman
COSPAR Panel on Conjugate Point Experiments

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# CONJUGATE INTERSECTS TO SELECTED GEOPHYSICAL STATIONS

## INTRODUCTION

In the past few years, the study of propagation of charged particles, electromagnetic radiation and magnetohydrodynamic waves along geomagnetic field lines has become a powerful tool in the search for a better knowledge of the structure of the Earth's magnetosphere.

The determination of the exact shape of a line of force, its change with local time and during geophysical perturbations, and the answer to the question of return to Earth of high latitude field lines, are of crucial importance to the problem of the interaction of the solar wind with the Earth's magnetic field. The process of propagation of magnetohydrodynamic and very low frequency electromagnetic waves along field lines gives information on the electron and ion densities encountered; the study of precipitation of energetic particles down the field lines into the atmosphere hopefully will lead to a better understanding of the injection and acceleration mechanisms in the magnetosphere.

Many of these investigations are based on ground measurements. Hundreds of IQSY and ex-IGY stations gather information which is being used or which could be used for these studies. These measurements are particularly valuable, if carried out simultaneously at both "ends" of the same field line. It is therefore very useful to know with maximum possible precision, the geometry of the field line which "goes through" each station, or which intersects the ionosphere at several given vertical altitudes, for a given field expansion and during normal, quiet geomagnetic conditions.

There are many useful parameters related to this "field line geometry." For this preliminary edition, we have selected the following:

1. Geographic coordinates of the station (or the vertical point at high altitude), henceforth called the origin of the field line;

2. Total field intensity at origin;

3. The magnetic dip at origin;

4. The magnetic declination at origin;

5. L-value corresponding to the origin (and within about 1%, to the whole line);

6. Geographic coordinates of the conjugate intersect, i.e. the intersection of the field line with the Earth's surface (or a fixed level at the same altitude as the origin), at the other side;

7. Total field intensity at the conjugate intersect;

8. Geographic coordinates of the equatorial point of the field line (defined as the point where the field intensity attains its minimum value on that line);

9. Total field intensity at the equatorial point of the field line;

10. Length of the field line between origin and conjugate intersect.

These quantities, which are printed out in the above order in Tables 2, 3, and 4, by no means represent all useful field magnitudes. However, for reasons of space and time, other important quantities are not reproduced here.

Stations included in our tables were selected from IQSY lists, as well as extracted more or less at random from old IGY tables. This selection by no means pretends to be complete; we apologize for omissions and possible errors in name-spelling, coordinates, etc.

A careful analysis of the geographic location of conjugate areas was made. About 380 stations have their conjugates over sea. Only 140 stations have conjugate intersects over land, 16 of them over Antarctica. And only 22 pairs of stations are nearly self-conjugate, some of them deliberately established as such, others just by chance. We present a list of these self-conjugate pairs, and give a survey of the geographic location of all other conjugate intersects which fall over land, indicating country, and whenever possible, the nearest town to the intersect.

Finally, for the sake of completeness, we present a series of maps with constant B and L contours, for altitudes between sea level and 3,000 Km.

## FIELD LINE PARAMETERS

### 1. Selection of Stations

All Stations were selected from lists published in IQSY Notes No. 4 (1963) and No. 11 (1965), as well as extracted more or less at random from the IGY Annals. Some stations of this latter group may be at present out of operation.

Whenever a group of stations appeared lumped together in the same geographical area, only one or two of them were picked out (generally the station bearing the name of the near by greater city – example: Of the pair of stations Godley Head and Christchurch, only the latter was kept).

For practical reasons, stations are given in our lists in alphabetical order, according to the first two letters.

### 2. Coordinates

All positions are given in geographic coordinates. Latitudes and longitudes are in degrees and decimal fractions; negative latitudes are South, negative longitudes are West, Altitudes and arc lengths are given in kilometers.

Information on altitude over sea level was not available for many stations. In case of doubt, sea level was adopted. A test has shown that a change of a few thousand meters in station altitude does not alter appreciably the values listed in our tables, except for stations at very low geomagnetic latitudes.

All calculations were performed for field lines passing through the stations, and through points 300 and 400 Km vertically above each. These two levels, which represent typical heights of the F2 layer in its diurnal variation, were believed to be of interest to ionospheric researchers. They may serve to obtain interpolated values for field line parameters of lines of force passing through other heights than the ones selected here.

### 3. Field Parameters

The geomagnetic field used in these calculations is the 48 term expansion by Jensen and Cain 1960.0.[1] A more recent field expansion by Cain et al.,[2] which takes into account the oblateness of the Earth and updates the field to 1965,

was applied to several stations for comparison.* Differences were very small; conjugate points fell within 20-30 Km of the positions given in our tables.

For the actual computation of the field, McIlwain's subroutine MAGNET was used.** Values of the field are given in gauss.† The error is expected to be of the order of $2 \times 10^{-3}$ gauss.

The conjugate intersect is defined as the intersection of the field line emerging from the origin (surface, 300 Km or 400 Km above s.l.), with a constant level of the same height as the origin. (See Figure 1).

The "minimum-B equator" is defined as the point of minimum total field intensity on a given line of force. The locus of all these points is, of course, not coincident with the magnetic dip equator.

The altitude of the minimum-B equator is very nearly equal to the maximum altitude of the field line except for low L lines ($L < 1.2$). Their latitudes, however, may differ appreciably. This was tested in separate runs for all stations.

The longitude of the minimum-B equator is the parameter "par excellence" to label a given field line on a L shell, in a nearly invariant way.[4]

For very low geomagnetic latitudes, it sometimes happens that there is no minimum-B value between origin and conjugate intersect. This means that the minimum-B equator of that particular field line lies below the origin, or below the conjugate intersect (Figure 2). This may even occur in the case of surface to surface tracing; it is an indication that in the region considered, there is a difference between the "magnetic" and the "minimum-B," or "invariant," equator.

Finally, the L-parameter,[3] given in Earth radii, is computed through McIlwain's INVAR subroutine.‡

---

*We are very much indebted to Dr. J. Cain for carrying out these calculations.

**MAGNET is part of INVAR (see footnote below).

†As we use "B", we should call the unit Oersted.

‡INVAR is a computer code written by C. E. McIlwain, which has been widely distributed.

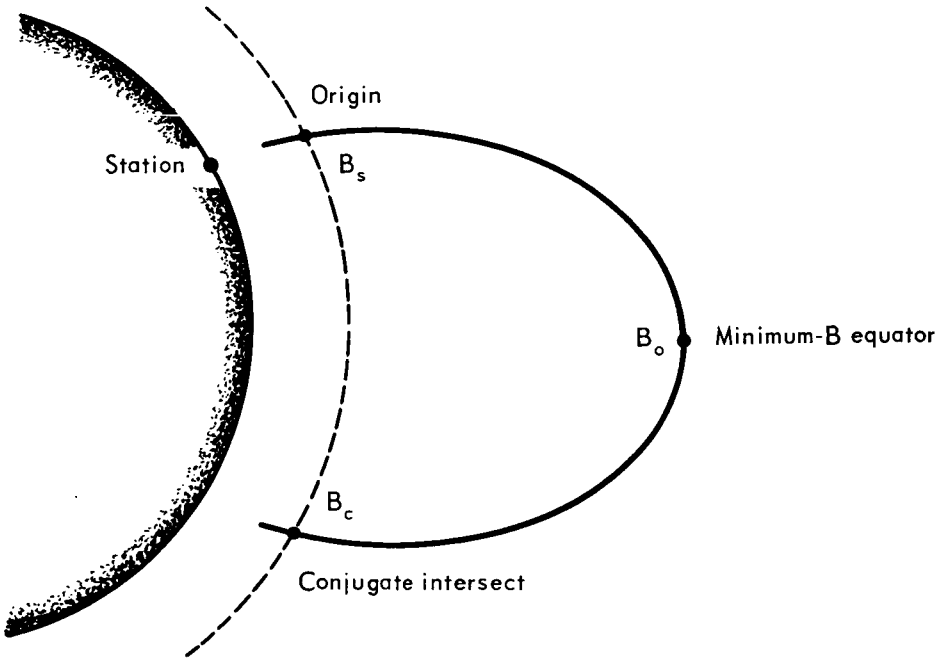


Figure 1

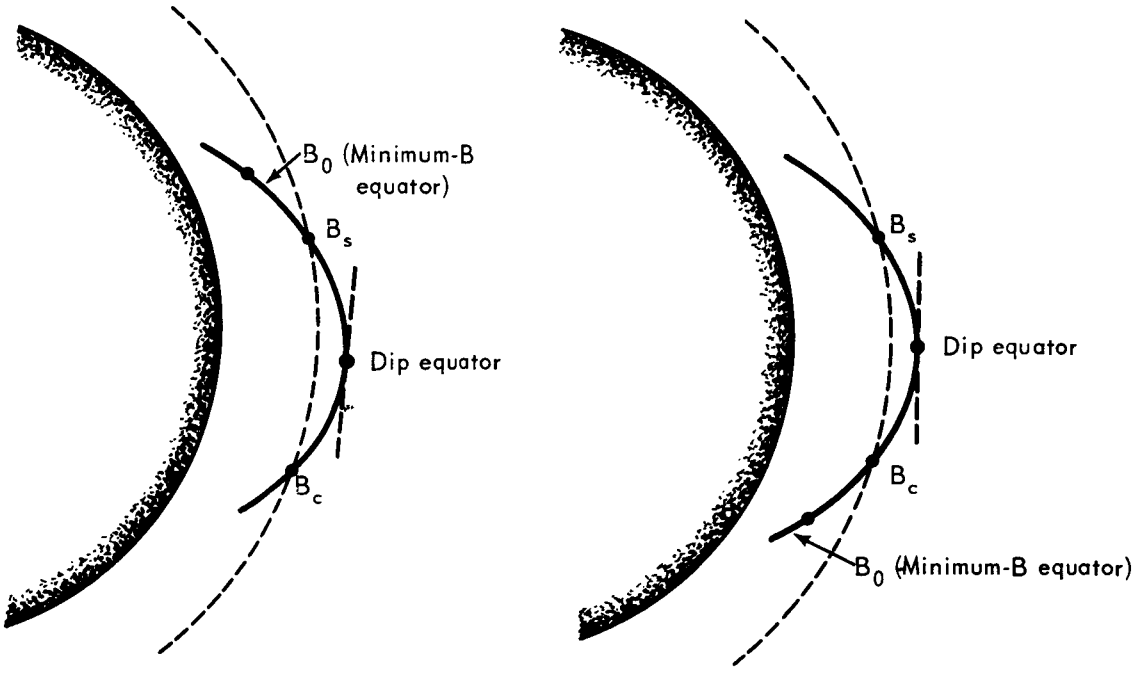


Figure 2

If L is high, say, above 8 earth radii, the field line expansion used in MAGNET is no longer valid, because external sources, as determined by the interaction of the solar wind with the earth's magnetosphere, can then no longer be neglected. This is the reason why field lines were traced only when $L \leq 12$. In general, above L = 8, this parameter merely has to be taken as a quantity related to the "invariant" latitude defined by $\cos^2 \Lambda = 1/L$.

It is well known [3,5] that L is constant for a given magnetic shell only within about 1%. Azimuthal asymmetry of the real geomagnetic field actually splits particle shells according to their equatorial pitch angles (or mirror point field intensities) at a given field line. The INVAR-computed L-values fluctuate on a given "L-shell," and even along a given field line. A good measure of this fluctuation is the quantity (L-Lo)/Lo where $Lo = (Mo/Bo)^{1/3}$ ($M = 0.3117$, Bo = minimum field intensity on the given field line). A test made with our results has shown that the longitude dependence of (L-Lo)/Lo is in excellent agreement with McIlwain's results (Figure 3 in [3]). A significant difference, however, arises in the region of longitudes between 5 and 35 degrees East, for L values in the interval 1.6 to 2.6. There we find computed L values 2 - 4% higher than the "azimuthally symmetric" value Lo.

For many purposes, it may be sufficient approximation to use Lo for the L value of a station, or of a point in space. The elimination of the subroutine INVAR from the program would then save considerable computer time.

In order to make our tables useful to cosmic ray physicists, we may point out the results of Smart and Shea,[6] who found an excellent correlation between L and the effective geomagnetic cosmic ray cutoff rigidity $P_c$. We have reanalyzed this correlation using the computed surface L values given in Table 2, and concluded that the effective cutoff rigidity can be found for each station by the expression

$$P_c = 15.60\, L^{-2} \text{ (GV)} \qquad (1)$$

valid for $L \gtrsim 1.2$. For equatorial regions this correlation breaks down.

## METHOD

### 1. Coordinate System Used

Figure 3 illustrates the system used. The field components along the unit vectors $u_v$, $u_N$ and $u_E$ are:

$B_V$ (vertical downwards)

$B_N$ (horizontal North)

$B_E$ (horizontal East)

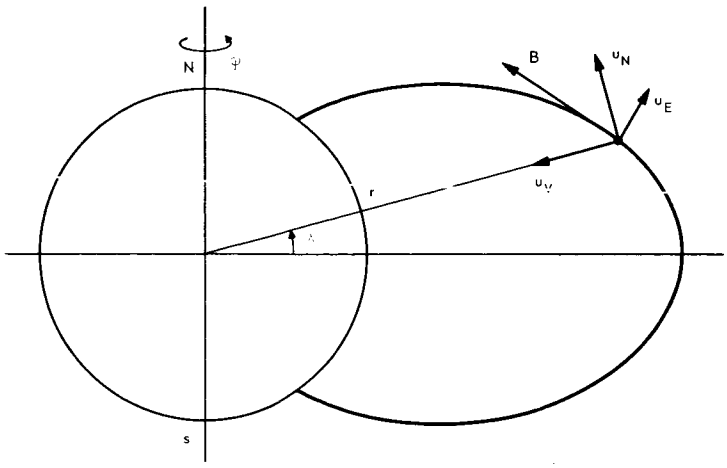


Figure 3

The equations defining an infinitesimal portion of a line of force are then:

$$\frac{\delta S}{B} = -\frac{\delta r}{B_V} = \frac{r\delta\lambda}{B_N} = \frac{r\cos\lambda\delta\varphi}{B_E} \tag{2}$$

$\delta S$ is the element of arc, with components $-\delta r$, $r\delta\lambda$ and $r\cos\lambda\delta\varphi$ along the unit vectors. The coordinates of a generic point of a field line originating at $r_s$, $\lambda_s$ and $\varphi_s$ are then given by

$$r_n = r_s + \sigma \sum_{i=1}^{n} \frac{B_{Vi}}{B_i} \delta S_i \tag{3a}$$

$$\lambda_n = \lambda_s - \sigma \sum_{i=1}^{n} \frac{1}{r_i} \frac{B_{Ni}}{B_i} \delta S_i \tag{3b}$$

$$\varphi_n = \varphi_s - \sigma \sum_{i=1}^{n} \frac{1}{r_i \cos\lambda_i} \frac{B_{Ei}}{B_i} \delta S_i \tag{3c}$$

where the sign factor $\sigma$ is $\pm 1$ according to whether one proceeds tracing in the opposite/same direction of the field vector. Notice that if the origin is in the magnetic Northern hemisphere ($B_V > 0$), we have to set $\sigma > 0$ in order to follow the line to the conjugate intersect* (direction opposite to $\vec{B}$).

*In our field computations using subroutine MAGNET, we obtain the West component of the field $B_W = -B_E$. For this reason we had to reverse the sign in (3c). (See listing, Table 1).

The total arc length between origin and a generic point is

$$Sn = \sum_{i=1}^{n} \delta Si \tag{4}$$

## COMPUTER PROGRAM

### 1. Procedure

The flow diagram is shown in Figure 4.

The altitude level of the origin is determined by an input parameter which permits one of three internally programmed choices (station altitude, 300 and 400 Km). Control parameters are initialized and the station is entered.

The L value is computed with McIlwain's INVAR subroutine. The L value is then tested; if $L > 12$, no tracing is attempted. Before the program returns to read in the next station, it computes the total field, the magnetic dip and the declination at the origin.

If $L \leq 12$, the code proceeds to trace the field line. The "Adams Four Point Integration Formula"[7] for numerical solutions of differential equations is used in this procedure repeatedly at equidistant intervals. The accuracy of this fit depends on the integration step size (element of arc length).

To increase efficiency and to save computer time, the constant step size D for a given field line was fixed as a linear function of L:

$$D = 50\,L - 30 \text{ (Km)} \tag{5}$$

Exhaustive testing with several step sizes for fixed L values has shown that relation (5) is satisfactory with respect to both accuracy and machine time.

Initial conditions for the integration of the dependent variables H (altitude), DLAT and DLON are given, and the total field and its components are computed. The dip and the declination are calculated only once, on the first passage through the integration loop. A suitable control causes this part of the program to be bypassed thereafter.

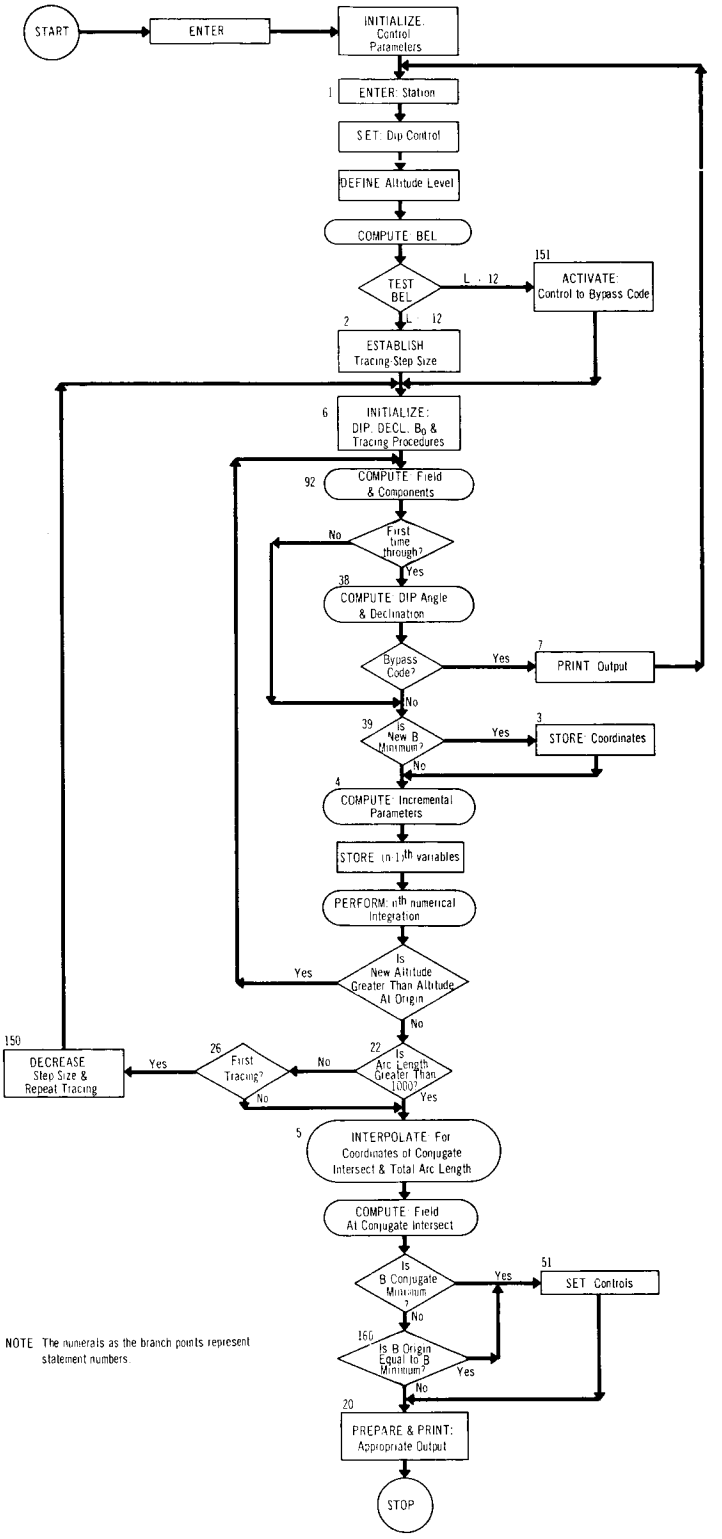
START
ENTER
INITIALIZE: Control Parameters
1
ENTER: Station
SET: Dip Control
DEFINE Altitude Level
COMPUTE BEL
151
TEST BEL
L = 12
ACTIVATE: Control to Bypass Code
2
L ≠ 12
ESTABLISH Tracing Step Size
6
INITIALIZE: DIP, DECL, $B_0$ & Tracing Procedures
92
COMPUTE Field & Components
No
First time through?
Yes
38
COMPUTE DIP Angle & Declination
Bypass Code?
Yes
7
PRINT Output
No
39
Is New B Minimum?
Yes
3
STORE Coordinates
No
4
COMPUTE Incremental Parameters
STORE (n-1)th variables
PERFORM nth numerical integration
Is New Altitude Greater Than Altitude At Origin
Yes
No
150
DECREASE Step Size & Repeat Tracing
Yes
26
First Tracing?
No
22
Is Arc Length Greater Than 1000?
No
Yes
5
INTERPOLATE For Coordinates of Conjugate Intersect & Total Arc Length
COMPUTE Field At Conjugate Intersect
Is B Conjugate Minimum?
Yes
51
SET Controls
No
160
Is B Origin Equal to B Minimum?
Yes
No
20
PREPARE & PRINT: Appropriate Output
STOP
NOTE The numerals as the branch points represent statement numbers.

**Figure 4**

## 2. Usage and Comments

The computer code is a FORTRAN II monitor controlled program written for the IBM 7090-7094, Standard or Moonlight system (Table 1).

Execution time varies from fractions of a second for low latitude stations (small L-values) to several seconds for stations at high latitudes (large L-values). For the 511 stations considered in this work, the average time was approximately 2 seconds per station.

The choice of altitude levels presently contained in the code is explained on page 3. Should other considerations prevail or different use be made of the routine, new values can easily be substituted in statements number 58 and 59.

An effort has been made to keep the code flexible for diverse usage. Additional quantities connected with a field line, such as:

a. maximum altitude attained above the earth's surface,

b. geographic coordinates of the intersect with the geographic equator,

c. conjugate mirror-points,

d. curvature of the equator,

e. field components at origin and conjugate intersect

may become readily available through minor modifications.

The field computing part of the program has been kept separate in the form of a subroutine. This is practical and advisable, as experience has shown. Since there exist several models describing the geomagnetic field in terms of a varying number of expansion coefficients and since periodic recomputations of these coefficients are necessary due to a gradually better knowledge of the field and its secular changes, this arrangement is most convenient for interchanging or updating the various models.

Two cases may arise which receive special treatment in the routine:

a. The origin may have an L-value greater than 12,

b. No minimum-B equator may lie between the origin and the conjugate intersect.

In both, the code will indicate their occurrence by printing relevant comments in place of the regular output.

In the tracing process, the location of the minimum-B equator is approximated on the field line with an error proportional to plus or minus one integration step.

There are no limitations with respect to the number of stations or the height of the origin.

The restriction $L \leq 12$ imposed on the shell parameter is due to physical (see page 5 ) and practical considerations only (to save computer time) and is entirely independent of the code itself. Lines with L-values greater than 100 have been traced repeatedly without any difficulty.

In the loop, the following sequence of operations is performed: (a) the total field intensity is tested at every step, and the coordinates and field intensity of the minimum-B point are stored; (b) the altitude, latitude and longitude increment parameters are evaluated; (c) the n-1 th dependent and independent variables are stored; (d) the nth numerical integration is performed.

The integration is terminated whenever the altitude $H_n$ is less or equal to the altitude of the origin $H_s$. The total arc length is then tested; if $S \leq 1000$ Km, the step size is decreased by a factor of 4, and the tracing is repeated for that given field line. This is done in order to obtain a better fit and to reduce the error in the location of the conjugate intersect, for low latitude stations.

If $S > 1000$, or after a second tracing, the coordinates of the conjugate intersect are obtained by interpolation, and the field intensity is computed at that point.

Finally, a test is made to determine whether the minimum-B equator lies between the origin and the conjugate intersect. The results are printed, and the next station is read in.

## RESULTS

Table 2 gives the results of our computations for surface-to-surface tracing for 511 geophysical stations. In column 1, the names of the stations are listed. Columns 2 and 3 give the geographical coordinates of the origin; column 4, the total field in gauss; columns 5 and 6, magnetic dip and declination in degrees

respectively; and column 7, the L value. Columns 8 and 9 give the coordinates of the conjugate intersect, column 10, the total field at the intersect. Columns 11 and 12 show the coordinates of the equatorial (minimum B) point of the corresponding field line, column 13, the field intensity there, and column 14, the altitude of this point over sea level (almost coincident with the maximum altitude over sea level of that line, except for low L values). Column 15, finally, gives the total arc length of the field line, between origin and conjugate intersect. All distances are in kilometers.

Tables 3 and 4 reproduce the values corresponding to field lines originating 300 and 400 Km above each station and intersecting the same altitude as the origin, at the conjugate point.

A detailed inspection of the conjugate areas has revealed several features. First of all, as expected, the great majority of the stations have conjugate areas over the sea. There are, nevertheless, 22 pairs of stations which are very nearly conjugate to each other. They are listed in Table 5. For additional information, the mean L value is given, as well as the percentage difference in L. With a few exceptions, this difference is not much greater than the intrinsic fluctuation of L. Another important parameter necessary to judge the "degree of conjugacy" of two stations, is given by the difference of longitudes of the equatorial points of the field lines passing through both stations. This is indicated in the last column of Table 5.

Inspecting Table 5 one recognizes well-known conjugate pairs, in addition to others. Notice in particular, the European-African group of conjugate pairs.

Table 6 lists stations with conjugate areas in the Antarctica. Those already listed in Table 5 are not shown here.

Finally, in Table 7 we give some information about the conjugate area for those stations whose conjugate intersects fall over land, but where there is no other station near by, belonging to our list. In this table, we list the name of the station in alphabetical order, the L value, the name of the city or of the region in the conjugate area, and the country in question.

## B-L CONTOURS

The last collection of figures represent constant B and L contours for different altitudes. They were obtained in the following way: For a given altitude level, a latitude-longitude grid is generated with constant intervals of five degrees for the first and of ten degrees for the latter. At those grid points, the magnetic parameters B and L are computed and stored.

The desired constant B or L contours are then obtained by a linear interpolation, which is performed separately for both. The resulting positions are then plotted by computer and the curves are drawn manually.

## ACKNOWLEDGMENTS

We are grateful to Dr. J. C. Cain for many useful discussions and for his advice. The helpful cooperation of Mrs. B. S. Roederer is also appreciated.

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6. D. F. Smart and M. A. Shea, A study of the effectiveness of the McIlwain coordinates in computing cosmic ray vertical cutoff rigidities, Transactions Am. Geophys. Union, 46, 63, 1965.

7. G. R. Slayton, Automatic integration of differential equations, IBM, SHARE-Distribution No. 413, 1958.

Table 1
Arguments and Parameters

I. Input:

| | | |
|---|---|---|
| J | : | fixed point parameter controlling starting altitude; for J = 1, 2, 3 altitude is fixed in the code to station height, 300, 400 Km, respectively. |
| BLAT | : | geographic latitude of station. |
| BLON | : | geographic longitude of station. |
| BH | : | height of station above sea level. |
| NAME | : | designation of station. |

II. Internal:

| | | |
|---|---|---|
| RAD | : | conversion factor, radians to degrees. |
| N | : | fixed point parameter counting lines per output page. |
| LP | : | fixed point parameter numbering tracings per line. |
| ITEST | : | fixed point parameter controlling dip angle and declination bypass |
| D | : | constant incremental change of independent variable (stepsize of integration along field line). |
| S | : | independent variable: total arc-length. |
| H | : | dependent variable: height above sea level. |
| DLAT | : | dependent variable: geographic latitude. |
| DLON | : | dependent variable: geographic longitude. |
| SGN | : | sign of vertical field component. |
| DECL | : | magnetic declination at origin. |
| HM | : | altitude above sea level of point of minimum B on field line. |
| B | : | field strength at generic point. |
| BN | : | North component of field vector at generic point. |
| BW | : | West component of field vector at generic point (See footnote page 6). |
| BV | : | vertical component of field vector at generic point. |
| FAC | : | factor for increment parameters DDLAT and DDLON. |
| DH | : | altitude increment parameter. |
| DDLAT | : | latitude increment parameter. |
| DDLON | : | longitude increment parameter. |
| CBN | : | same as BN at conjugate intersect. |
| CBW | : | same as BW at conjugate intersect. |
| CBV | : | same as BV at conjugate intersect. |

Table 1 (Continued)

| | | |
|---|---|---|
| SP | : | (n-1)th reference arclength for conjugate intersect approximation |
| DLATP | : | (n-1)th reference latitude for conjugate intersect approximation |
| DLONP | : | (n-1)th reference longitude for conjugate intersect approximation |
| HP | : | (n-1)th reference altitude for conjugate intersect approximation |
| C2 | : | ratio of B(min) minus B(orig) to B(orig). |

III. Output:

| | | |
|---|---|---|
| BB | : | field strength at origin. |
| DIP | : | dip-angle at origin. |
| IDECL | : | see DECL |
| BEL | : | magnetic shell parameter L of field line through origin. |
| CLAT | : | geographic latitude of conjugate intersect. |
| CLON | : | geographic longitude of conjugate intersect. |
| CB | : | field strength at conjugate intersect. |
| DLATM | : | geographic latitude of minimum B point on field line. |
| DLONM | : | geographic longitude of minimum B point on field line. |
| IHM | : | see HM |
| BX | : | minimum field strength on field line. |
| DS | : | total arclength between origin and conjugate intersect. |

NOTE: All arguments are in floating point form, except where otherwise indicated.

## Table 1

## FORTRAN LISTING

```
*      CARDS COLUMN
*      LIST 8
*      LABEL
CLOF1A
C      MODIFIED LOF TRACER, VERSION NO. 3 FOR ALL STARTING ALTITUDES
C      FIELD COMPUTATION BY MCILWAINS MAGNET
C      PARAMETER  J  HAS FOLLOWING VALUES AND MEANING =
C         J=1  LOF TRACING FROM SURFACE TO SURFACE
C         J=2  LOF TRACING 300 KM ABOVE STATION TO 300 KM CONJ.INTERSECT
C         J=3  LOF TRACING 400 KM ABOVE STATION TO 400 KM CONJ.INTERSECT
       DIMENSION NAME(3)
       READ INPUT TAPE 2,1004,J
 1004  FORMAT(I3)
            RAD=57.2957795
       K = 1
       N = 0
    1  READ INPUT TAPE 2,1005,BLAT,BLON,BH,NAME
 1005  FORMAT(2F11.2,F8.2,3A6)
       ITEST = 1
       LP = 1
       IF(J - 2)57,58,59
   58  BH  = 300.
       GO TO 57
   59  BH  = 400.
   57  CALL INVAR(BLAT,BLON,BH ,0.01,BB,BEL)
       IF(BEL - 12.)2,2,151
  151  SENSE LIGHT 4
       GO TO 6
    2  D = 50.*BEL - 30.
    6  DLAT = BLAT
       DLON = BLON
       H = BH
   91  S=0.0
       SENSE LIGHT 1
       BX = 5.
   92  CALL FIELD(DLAT,DLON,H,BN,BW,BV,B)
       GO TO (38,39),ITEST
   38  DIP = ATANF(BV/SQRTF(BN**2 + BW**2))*RAD
       SGN = SIGNF(1.,BV)
       DECL =(ATANF(-BW/BN))*RAD
       IDECL = DECL + .5
   37  ITEST = 2
       IF(SENSE LIGHT 4) 7,39
    7  IF(N)9,9,10
    9  WRITE OUTPUT TAPE 3,73
       WRITE OUTPUT TAPE 3,74
   10  WRITE OUTPUT TAPE 3,77,NAME,BLAT,BLON,BB,DIP,IDECL,BEL
   77  FORMAT(1X3A6,F8.2,F9.2,F7.3,F6.1,I6,F7.2,4X55H** N O   C O M P U T
     1 A T I O N S   P E R F O R M E D **)
       N = N + 1
       GO TO 1
   39  IF(B - BX)3,4,4
    3  DLATM=DLAT
       DLONM=DLON
       HM = H
       BX=B
    4  DH = (BV/B)*SGN
       FAC=SIGNF(RAD/(B*(H+6371.2)),SGN)
       DDLAT=-BN*FAC
       DDLON= BW*FAC/COSF(DLAT/RAD)
       SP = S
```

```
      HP = H
      DLATP = DLAT
      DLONP = DLON
      S=INDVF(S,D)
      H=DPNVF(H,DH)
      DLAT=DPNVF(DLAT,DDLAT)
      DLON=DPNVF(DLON,DDLON)
      IF(H - BH)22,22,92
   22 IF(S - 1000.)26,26,5
   26 GO TO (150,5),LP
  150 D = D/4.
      LP = 2
      GO TO 6
    5 DLAT = DLATP + (DLAT - DLATP)*(BH    - HP)/(H - HP)
      DLON = DLONP + (DLON - DLONP)*(BH    - HP)/(H - HP)
      DS = SP + (S - SP)*(BH    - HP)/(H - HP)
      H = BH
      CLAT = DLAT
      CLON = DLON
      CALL FIELD(CLAT,CLON,H,CBN,CBW,CBV,CB)
      IHM = HM + .5
      IF (CB - BX)51,51,160
  160 C2 = BX/BB - 1.
   52 IF(ABSF(C2) - 1.E-5)51,51,20
   51 SENSE LIGHT 2
      SENSE LIGHT 3
   20 IF(ABSF(CLON) - 180.)88,88,87
   87 IF(CLON)82,88,83
   82 CLON = CLON + 360.
      GO TO 88
   83 CLON = CLON - 360.
   88 IF(SENSE LIGHT 3)46,45
   45 IF(ABSF(DLONM) - 180.)46,46,84
   84 IF(DLONM)85,46,86
   85 DLONM = DLONM + 360.
      GO TO 46
   86 DLONM = DLONM - 360.
   46 IF(N)30,30,21
   30 WRITE OUTPUT TAPE 3,73
   73 FORMAT(131H1    STATIONS      **      O     R     I     G     I
     1   N    ** CONJUGATE  INTERS. **  MINIMUM-B   E Q U A T O R  ** AR
     2C          //)
      WRITE OUTPUT TAPE 3,74
   74 FORMAT(22X4HLAT.,5X5HLONG.,4X1HB,4X3HDIP,3X5HDECL.,3X1HL,5X4HLAT.,
     13X5HLONG.,4X1HB,5X4HLAT.,4X5HLONG.,4X4HALT.,4X1HB,6X2HKM///)
   21 IF(SENSE LIGHT 2)23,31
   23 WRITE OUTPUT TAPE 3,78,NAME,BLAT,BLON,BB,DIP,IDECL,BEL,CLAT,CLON,C
     1B,DS
   78 FORMAT(1X3A6,F8.2,F9.2,F7.3,F6.1,I6,F7.2,F7.1,F8.1,F7.3,4X28HNO MI
     1NIMUM B BETWEEN INTERS.,F8.0)
      GO TO 90
   31 WRITE OUTPUT TAPE 3,75,NAME,BLAT,BLON,BB,DIP,IDECL,BEL,CLAT,CLON,C
     1B,DLATM,DLONM,IHM,BX,DS
   75 FORMAT(1X3A6,F8.2,F9.2,F7.3,F6.1,I6,F7.2,F7.1,F8.1,F7.3,F8.2,F9.2,
     1I7,F7.3,F9.0)
   90 N = N + 1
      IF(N - 45)32,33,33
   33 N = 0
      WRITE OUTPUT TAPE 3,76,K
   76 FORMAT(////60X5HPAGE I4)


      K = K + 1
   32 GO TO 1
      END
```

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** C | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| ABASHIRI | 43.97 | 140.33 | 0.506 | 58.4 | -8 | 1.50 | -26.5 | 137.8 | 0.557 | 9.17 | 140.61 | 3571 | 0.092 | 13461 |
| ABISKO | 68.35 | 18.82 | 0.515 | 77.3 | 2 | 5.69 | -59.5 | 64.0 | 0.482 | 3.46 | 33.52 | 29669 | 0.002 | 86886 |
| ABERYSTWYTH | 52.40 | -4.07 | 0.477 | 68.0 | -9 | 2.57 | -47.4 | 24.8 | 0.321 | 0.40 | 7.34 | 9456 | 0.019 | 30770 |
| ACCRA | 5.63 | -0.20 | 0.311 | -7.4 | -11 | 1.00 | 11.8 | -1.5 | 0.323 | 6.95 | -0.49 | 15 | 0.311 | 710 |
| ADEN | 12.77 | 44.97 | 0.369 | 9.7 | 1 | 0.96 | 4.7 | 44.9 | 0.351 | 6.78 | 44.89 | 30 | 0.348 | 906 |
| ADDIS ABABA | 9.03 | 38.77 | 0.353 | -1.4 | 1 | 0.96 | 10.2 | 38.8 | 0.355 | NO MINIMUM B BETWEEN INTERS. | | | | 129 |
| ADELAIDE | -34.95 | 138.53 | 0.606 | -67.3 | 7 | 2.03 | 53.2 | 143.3 | 0.542 | 9.52 | 142.68 | 6945 | 0.037 | 22995 |
| ADAK | 51.90 | -176.65 | 0.486 | 63.4 | 9 | 2.11 | -38.9 | 164.8 | 0.587 | 6.03 | 174.60 | 7253 | 0.034 | 24137 |
| AGINCOURT | 43.80 | -79.30 | 0.585 | 74.3 | -7 | 3.33 | -69.8 | -99.9 | 0.547 | -12.38 | -79.11 | 14726 | 0.008 | 45473 |
| AHMEDABAD | 23.02 | 72.60 | 0.447 | 32.1 | -1 | 1.00 | -5.3 | 74.6 | 0.404 | 7.81 | 73.34 | 499 | 0.303 | 3521 |
| AIRE-SUR-ADOUR | 43.70 | -0.30 | 0.452 | 60.1 | -6 | 1.75 | -32.1 | 17.3 | 0.314 | 2.66 | 7.23 | 4447 | 0.059 | 16188 |
| AKROTIRI | 34.58 | 32.95 | 0.447 | 49.0 | 3 | 1.25 | -16.1 | 35.6 | 0.345 | 6.91 | 33.34 | 1720 | 0.156 | 7764 |
| AKLAVIK | 68.23 | -135.00 | 0.587 | 81.3 | 40 | 9.05 | -62.8 | 167.8 | 0.661 | 1.29 | -162.72 | 51758 | 0.000 | 147107 |
| AKITA | 39.73 | 140.13 | 0.483 | 53.7 | -7 | 1.35 | -22.7 | 138.1 | 0.531 | 9.03 | 140.45 | 2586 | 0.128 | 10596 |
| ALMERIA | 36.85 | -2.47 | 0.426 | 52.4 | -7 | 1.41 | -22.9 | 11.0 | 0.320 | 3.63 | 3.74 | 2494 | 0.108 | 10326 |
| ALDAN | 58.60 | 125.50 | 0.591 | 74.6 | -12 | 2.61 | -39.4 | 124.8 | 0.629 | 10.24 | 125.99 | 10707 | 0.017 | 33282 |
| ALERT | 82.55 | -63.58 | 0.560 | 85.9 | -86 | 246.02 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| ALMA-ATA | 43.20 | 76.92 | 0.558 | 62.8 | 3 | 1.53 | -25.7 | 82.7 | 0.486 | 8.35 | 77.75 | 3809 | 0.085 | 13834 |
| ALBUQUERQUE | 35.08 | -106.62 | 0.536 | 62.8 | 13 | 1.89 | -49.1 | -128.5 | 0.517 | -7.94 | -114.50 | 5762 | 0.045 | 20036 |
| ALMIRANTE BROWN | -64.88 | -62.87 | 0.436 | -57.8 | 17 | 2.31 | 35.9 | -65.5 | 0.534 | -12.97 | -59.60 | 8083 | 0.025 | 27181 |
| ANCON | -11.77 | -77.15 | 0.286 | 0.5 | 6 | 1.03 | -12.3 | -77.2 | 0.285 | NO MINIMUM B BETWEEN INTERS. | | | | 57 |
| ANCHORAGE | 61.17 | -149.98 | 0.558 | 74.1 | 27 | 4.12 | -53.6 | 172.2 | 0.634 | 2.95 | -168.74 | 20139 | 0.004 | 59846 |
| ANTOFAGASTA | -23.65 | -70.42 | 0.263 | -18.4 | 5 | 1.08 | -3.1 | -69.7 | 0.313 | -16.64 | -69.91 | 176 | 0.248 | 2373 |
| APIA | -13.80 | -171.77 | 0.398 | -28.8 | 12 | 1.05 | 15.2 | -166.1 | 0.342 | 2.47 | -168.55 | 456 | 0.273 | 3606 |
| APATITY | 67.55 | 33.33 | 0.525 | 77.6 | 12 | 5.02 | -55.7 | 69.4 | 0.488 | 5.22 | 43.60 | 25502 | 0.002 | 75121 |
| ARKHANGELSK | 64.58 | 40.50 | 0.531 | 76.7 | 15 | 4.07 | -51.7 | 69.1 | 0.473 | 5.95 | 47.44 | 19450 | 0.005 | 58219 |
| ARCETRI | 43.75 | 11.25 | 0.457 | 59.6 | -2 | 1.66 | -29.0 | 24.3 | 0.324 | 4.33 | 16.30 | 4042 | 0.068 | 14897 |
| AREQUIPA | -16.35 | -71.57 | 0.270 | -6.2 | 4 | 1.05 | -9.8 | -71.2 | 0.286 | NO MINIMUM B BETWEEN INTERS. | | | | 729 |
| ARGENTINE ISLAND | -65.25 | -64.27 | 0.441 | -58.2 | 18 | 2.35 | 36.3 | -66.0 | 0.536 | -13.17 | -60.30 | 8312 | 0.024 | 27818 |
| ARMIDALE | -30.30 | 151.40 | 0.565 | -60.9 | 11 | 1.65 | 46.9 | 159.5 | 0.474 | 8.24 | 156.83 | 4392 | 0.071 | 15974 |
| ASSWAN | 23.97 | 32.78 | 0.398 | 30.7 | 2 | 1.04 | -3.7 | 33.1 | 0.342 | 8.14 | 32.71 | 466 | 0.272 | 3413 |
| ASO | 32.88 | 131.02 | 0.470 | 46.7 | -5 | 1.17 | -16.5 | 130.3 | 0.493 | 8.72 | 131.52 | 1505 | 0.195 | 7224 |
| ASHKABAD | 37.93 | 55.10 | 0.502 | 56.3 | 5 | 1.37 | -22.0 | 59.7 | 0.385 | 6.68 | 55.42 | 2573 | 0.121 | 10349 |
| ATHENS | 37.97 | 23.72 | 0.448 | 52.8 | 1 | 1.36 | -19.7 | 29.3 | 0.340 | 6.36 | 25.48 | 2316 | 0.122 | 9636 |
| BAJA | 46.18 | 19.00 | 0.471 | 62.2 | 1 | 1.79 | -31.5 | 31.5 | 0.327 | 4.53 | 23.15 | 4791 | 0.056 | 17070 |
| BAGHDAD | 33.35 | 44.38 | 0.462 | 49.0 | 4 | 1.23 | -16.4 | 46.4 | 0.353 | 6.54 | 44.30 | 1649 | 0.165 | 7538 |
| BANGKOK | 13.75 | 100.55 | 0.417 | 9.9 | 1 | 0.92 | 5.4 | 100.4 | 0.411 | 9.06 | 100.49 | 40 | 0.401 | 932 |
| BAR I | 69.58 | -140.18 | 0.583 | 81.3 | 38 | 9.21 | -62.0 | 163.8 | 0.663 | 2.52 | -168.72 | 52826 | 0.000 | 150008 |
| BALBOA | 8.95 | -79.57 | 0.387 | 37.3 | 4 | 1.17 | -32.7 | -85.2 | 0.313 | -13.60 | -81.42 | 912 | 0.194 | 5542 |
| BAIE ST. PAUL | 47.43 | -70.50 | 0.579 | 75.8 | -19 | 4.03 | -75.5 | -79.2 | 0.539 | -12.46 | -64.90 | 19044 | 0.005 | 57701 |
| BARTER ISLAND | 70.13 | -143.67 | 0.581 | 81.1 | 37 | 9.05 | -61.4 | 161.9 | 0.664 | 3.18 | -172.15 | 51803 | 0.000 | 147162 |
| BAKER LAKE | 64.30 | -96.08 | 0.608 | 86.3 | 4 | 15.00 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| BATTLE CREEK | 42.27 | -85.17 | 0.586 | 73.1 | -0 | 3.01 | -65.9 | -109.6 | 0.551 | -11.79 | -87.99 | 12776 | 0.011 | 39911 |
| BANARAS | 25.33 | 83.02 | 0.467 | 35.3 | -0 | 1.02 | -6.2 | 84.7 | 0.429 | 8.64 | 83.62 | 629 | 0.293 | 4015 |
| BANGUI | 4.60 | 18.58 | 0.332 | -16.1 | -5 | 0.99 | 17.7 | 17.5 | 0.355 | 9.56 | 18.11 | 98 | 0.319 | 1500 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** C | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| BASE ROI BAUDOUIN | -70.43 | 23.32 | 0.457 | -65.0 | -32 | 5.21 | 59.5 | -31.7 | 0.516 | -5.35 | -11.56 | 26283 | 0.002 | 78127 |
| BANGUI | 18.42 | 120.58 | 0.409 | 19.0 | 0 | 0.95 | -0.8 | 120.1 | 0.411 | 7.93 | 120.45 | 165 | 0.364 | 1986 |
| BELEM | -1.00 | -49.00 | 0.298 | 15.9 | -14 | 1.09 | -17.2 | -44.6 | 0.247 | -13.69 | -45.60 | 90 | 0.244 | 1913 |
| BELSK | 51.84 | 20.80 | 0.487 | 67.3 | 2 | 2.24 | -39.7 | 38.8 | 0.334 | 4.00 | 26.23 | 7527 | 0.029 | 25000 |
| BETTLES | 66.90 | -151.84 | 0.570 | 77.8 | 29 | 5.98 | -57.1 | 164.2 | 0.654 | 3.62 | -174.69 | 32092 | 0.001 | 92780 |
| BEDFORD | 42.48 | -71.28 | 0.569 | 72.8 | -14 | 3.11 | -70.8 | -79.3 | 0.511 | -12.90 | -66.99 | 13244 | 0.010 | 41532 |
| BERMUDA | 32.37 | -64.67 | 0.516 | 64.4 | -13 | 2.04 | -61.3 | -60.9 | 0.404 | -13.43 | -59.01 | 6303 | 0.036 | 22148 |
| BECGRAD | 44.80 | 20.52 | 0.468 | 60.8 | 1 | 1.69 | -29.4 | 31.4 | 0.329 | 4.96 | 24.05 | 4253 | 0.065 | 15473 |
| BIRD | 56.50 | 94.20 | 0.605 | 75.7 | 2 | 2.48 | -38.0 | 101.1 | 0.585 | 9.80 | 95.52 | 9907 | 0.020 | 30963 |
| BISMARK | 46.82 | -100.77 | 0.599 | 74.6 | 12 | 3.38 | -62.6 | -135.3 | 0.592 | -8.95 | -110.21 | 15304 | 0.008 | 46711 |
| BJORNOYA | 74.52 | 19.02 | 0.527 | 80.1 | 1 | 9.55 | -63.7 | 77.3 | 0.546 | 4.23 | 40.59 | 54426 | 0.000 | 155251 |
| BORCK | 58.03 | 38.33 | 0.521 | 72.9 | 11 | 2.86 | -45.2 | 59.3 | 0.410 | 5.62 | 42.80 | 11716 | 0.013 | 36681 |
| BOLOGNA | 44.50 | 11.35 | 0.459 | 60.4 | -2 | 1.71 | -30.1 | 25.0 | 0.323 | 4.19 | 16.57 | 4307 | 0.063 | 15683 |
| BOULDER | 40.03 | -105.30 | 0.566 | 67.9 | 14 | 2.32 | -54.4 | -131.9 | 0.552 | -7.99 | -114.16 | 8516 | 0.024 | 27777 |
| BOMBAY | 19.00 | 72.83 | 0.427 | 23.7 | -1 | 0.96 | -1.2 | 74.3 | 0.396 | 7.84 | 73.45 | 247 | 0.345 | 2383 |
| BOGOTA | 4.63 | -74.08 | 0.359 | 31.8 | 1 | 1.13 | -30.5 | -77.2 | 0.285 | -15.23 | -74.97 | 605 | 0.213 | 4414 |
| BRISBANE | -27.53 | 152.92 | 0.546 | -57.6 | 10 | 1.51 | 43.7 | 160.5 | 0.454 | 8.32 | 157.96 | 3487 | 0.093 | 13394 |
| BUDAPEST | 46.68 | 21.27 | 0.475 | 62.7 | 2 | 1.81 | -32.1 | 33.6 | 0.328 | 4.79 | 25.11 | 4964 | 0.053 | 17559 |
| BUENOS AIRES | -34.52 | -58.50 | 0.255 | -32.1 | 0 | 1.20 | 7.2 | -62.1 | 0.364 | -16.28 | -59.45 | 819 | 0.183 | 5412 |
| BUNIA | 1.53 | 30.18 | 0.340 | -22.1 | -1 | 1.00 | 19.7 | 30.0 | 0.375 | 8.70 | 29.98 | 192 | 0.311 | 2114 |
| BYRD STATION | -79.98 | -120.02 | 0.605 | -74.8 | 70 | 7.25 | 55.7 | -78.9 | 0.601 | -12.02 | -77.34 | 39758 | 0.001 | 114912 |
| CAPRI | 40.57 | 14.33 | 0.448 | 55.9 | -1 | 1.48 | -23.9 | 24.0 | 0.332 | 5.20 | 18.07 | 3004 | 0.094 | 11772 |
| CASTEL TESINO | 46.05 | 11.65 | 0.464 | 62.0 | -1 | 1.81 | -32.4 | 26.5 | 0.321 | 3.88 | 17.23 | 4899 | 0.054 | 17430 |
| CATANIA | 37.50 | 15.07 | 0.437 | 51.9 | -1 | 1.35 | -19.5 | 22.7 | 0.336 | 6.05 | 18.09 | 2250 | 0.123 | 9462 |
| CAPE CHELYUSKIN | 77.72 | 104.28 | 0.578 | 86.2 | 17 | 9.36 | -56.4 | 113.3 | 0.646 | 10.83 | 104.41 | 53708 | 0.000 | 152202 |
| CAPE ZHELANIA | 76.90 | 68.60 | 0.562 | 83.9 | 29 | 9.33 | -58.0 | 98.4 | 0.607 | 9.65 | 77.70 | 53367 | 0.000 | 151583 |
| CAPE SCHMIDT | 68.87 | -179.48 | 0.560 | 77.1 | 10 | 5.16 | -52.7 | 150.9 | 0.657 | 7.15 | 164.48 | 26858 | 0.002 | 78214 |
| CAMBRIDGE UK | 52.22 | 0.10 | 0.476 | 67.7 | -7 | 2.49 | -45.4 | 26.7 | 0.320 | 1.09 | 10.43 | 8908 | 0.021 | 29160 |
| CARIBOU | 46.87 | -68.02 | 0.573 | 75.1 | -21 | 3.85 | -75.3 | -70.8 | 0.525 | -12.21 | -61.19 | 17919 | 0.005 | 54631 |
| CALCUTTA | 22.93 | 88.52 | 0.455 | 30.0 | -0 | 0.98 | -3.3 | 89.4 | 0.427 | 9.05 | 88.87 | 425 | 0.327 | 3204 |
| CAPE HALLETT | -72.32 | 178.22 | 0.660 | -83.6 | -87 | 16.06 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | ** | | |
| CAMPBELL ISLAND | -52.55 | 169.15 | 0.635 | -76.0 | 27 | 4.02 | 61.7 | -154.9 | 0.553 | 3.48 | -173.05 | 19492 | 0.005 | 58042 |
| CANBERRA | -35.32 | 149.00 | 0.596 | -66.2 | 11 | 1.99 | 52.5 | 158.5 | 0.507 | 8.50 | 155.25 | 6593 | 0.040 | 22151 |
| CAPETOWN | -34.15 | 18.32 | 0.312 | -65.8 | -27 | 1.83 | 45.0 | -0.6 | 0.456 | 2.25 | 7.43 | 4970 | 0.052 | 17738 |
| CAMDEN | -34.08 | 150.68 | 0.587 | -64.8 | 12 | 1.89 | 51.0 | 160.2 | 0.496 | 8.26 | 156.90 | 5907 | 0.047 | 20246 |
| CAPE CANAVERAL | 28.40 | -80.60 | 0.517 | 61.4 | 0 | 1.77 | -53.9 | -93.5 | 0.442 | -13.05 | -82.23 | 4812 | 0.055 | 17556 |
| CAPE JONES | 54.50 | -79.50 | 0.602 | 80.9 | -18 | 6.58 | -78.8 | -117.7 | 0.602 | -12.04 | -78.49 | 35450 | 0.001 | 102970 |
| CEBU | 10.33 | 123.90 | 0.392 | 6.2 | 1 | 0.93 | 4.7 | 123.8 | 0.394 | 7.82 | 123.85 | 17 | 0.388 | 625 |
| CHAMICAL | -30.33 | -66.33 | 0.260 | -27.3 | 5 | 1.14 | 2.7 | -66.6 | 0.342 | -16.79 | -65.83 | 495 | 0.213 | 4049 |
| CHURCHILL | 58.77 | -94.17 | 0.613 | 83.5 | 3 | 8.63 | -74.4 | -152.6 | 0.638 | -9.64 | -103.74 | 48685 | 0.000 | 139215 |
| CHAMBON-LA-FORET | 48.02 | 2.27 | 0.466 | 64.1 | -5 | 2.07 | -38.0 | 22.9 | 0.312 | 1.98 | 10.59 | 6201 | 0.038 | 21324 |
| CHICAGO | 41.83 | -87.67 | 0.585 | 72.5 | 2 | 2.90 | -64.3 | -113.1 | 0.552 | -11.56 | -91.62 | 12122 | 0.012 | 33040 |
| CHARLOTTESVILLE | 38.03 | -78.22 | 0.564 | 70.1 | -5 | 2.54 | -64.7 | -93.7 | 0.506 | -12.98 | -78.06 | 9694 | 0.019 | 31436 |
| CHITA | 52.05 | 113.48 | 0.595 | 70.9 | -7 | 2.00 | -33.5 | 115.4 | 0.597 | 10.03 | 114.70 | 6916 | 0.038 | 22646 |
| CHITTAGONG | 22.35 | 91.82 | 0.453 | 28.7 | -0 | 0.97 | -2.7 | 92.4 | 0.428 | 9.09 | 92.04 | 384 | 0.336 | 3029 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** C | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| CHRISTCHURCH | -43.57 | 172.80 | 0.594 | -68.9 | 21 | 2.41 | 53.0 | -162.4 | 0.506 | 4.19 | -174.57 | 9166 | 0.023 | 29497 |
| CHACALTAYA | -16.32 | -68.15 | 0.265 | -5.4 | 1 | 1.06 | -10.5 | -68.1 | 0.280 | NO MINIMUM B BETWEEN INTERS. | | | | 647 |
| CLIMAX | 39.37 | -106.18 | 0.561 | 67.1 | 14 | 2.24 | -53.4 | -132.1 | 0.546 | -7.73 | -115.00 | 8010 | 0.027 | 26349 |
| CLONCURRY | -20.67 | 140.50 | 0.515 | -50.8 | 6 | 1.28 | 37.5 | 142.7 | 0.463 | 8.96 | 142.83 | 2147 | 0.149 | 9310 |
| CONCORD | 43.20 | -71.53 | 0.571 | 73.3 | -14 | 3.23 | -71.5 | -80.3 | 0.516 | -12.65 | -67.25 | 13969 | 0.009 | 43546 |
| COOK | -30.63 | 130.40 | 0.587 | -63.8 | 4 | 1.74 | 48.7 | 131.8 | 0.552 | 9.53 | 132.55 | 5165 | 0.059 | 17896 |
| COLLEGE | 64.85 | -147.83 | 0.570 | 77.0 | 30 | 5.43 | -56.9 | 168.6 | 0.648 | 2.94 | -169.77 | 28588 | 0.002 | 83146 |
| CORINALDO | 43.63 | 13.00 | 0.458 | 59.4 | -1 | 1.65 | -28.5 | 25.3 | 0.326 | 4.46 | 17.68 | 3960 | 0.070 | 14644 |
| COIMBRA | 40.22 | -8.42 | 0.440 | 57.1 | -10 | 1.62 | -30.2 | 9.9 | 0.309 | 1.58 | -0.05 | 3677 | 0.073 | 13973 |
| CONCEPCION | -36.58 | -72.98 | 0.291 | -35.8 | 12 | 1.21 | 9.1 | -70.7 | 0.386 | -15.53 | -70.51 | 1042 | 0.176 | 6134 |
| CORDOBA | -31.32 | -64.22 | 0.258 | -28.3 | 4 | 1.15 | 3.6 | -65.2 | 0.346 | -16.70 | -64.04 | 557 | 0.206 | 4330 |
| COLOMBO | 6.90 | 79.87 | 0.400 | -6.5 | -3 | 0.92 | 12.2 | 79.5 | 0.407 | 8.62 | 79.76 | 15 | 0.398 | 591 |
| COCOS ISLAND | -12.20 | 96.90 | 0.470 | -45.5 | -2 | 1.11 | 31.1 | 96.0 | 0.506 | 9.08 | 96.29 | 1239 | 0.226 | 6143 |
| COPENHAGEN | 55.75 | 12.50 | 0.488 | 70.1 | -0 | 2.75 | -47.0 | 38.6 | 0.345 | 2.70 | 21.21 | 10703 | 0.016 | 34137 |
| CORAL HARBOUR | 64.20 | -83.40 | 0.600 | 85.6 | -33 | 17.14 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| CRACOW | 50.05 | 19.95 | 0.482 | 65.8 | 2 | 2.10 | -37.2 | 36.1 | 0.328 | 4.18 | 24.97 | 6546 | 0.036 | 22176 |
| CURACAO | 12.08 | -68.84 | 0.404 | 43.5 | -3 | 1.27 | -40.3 | -70.2 | 0.297 | -15.57 | -67.87 | 1402 | 0.152 | 7419 |
| CUZCO | -13.52 | -71.98 | 0.276 | -1.0 | 3 | 1.05 | -12.5 | -71.9 | 0.279 | NO MINIMUM B BETWEEN INTERS. | | | | 116 |
| DAVIS | -68.60 | 78.00 | 0.563 | -73.2 | -68 | 14.02 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| DAPANGO | 10.80 | 0.07 | 0.321 | 4.2 | -10 | 1.00 | 7.3 | 0.8 | 0.315 | NO MINIMUM B BETWEEN INTERS. | | | | 402 |
| DALLAS | 32.78 | -96.80 | 0.536 | 62.7 | 9 | 1.86 | -51.1 | -116.8 | 0.497 | -10.10 | -102.87 | 5551 | 0.047 | 19485 |
| DAKAR | 14.66 | -17.43 | 0.328 | 20.8 | -13 | 1.05 | -4.8 | -11.9 | 0.288 | 2.42 | -14.08 | 211 | 0.265 | 2363 |
| DARWIN-COONAWARRA | -12.43 | 130.90 | 0.465 | -39.2 | 3 | 1.09 | 28.4 | 131.5 | 0.443 | 8.63 | 131.84 | 975 | 0.243 | 5482 |
| DEBRECEN | 47.48 | 21.65 | 0.477 | 63.5 | 2 | 1.87 | -33.2 | 34.6 | 0.328 | 4.63 | 25.64 | 5294 | 0.049 | 18525 |
| DE BILT | 52.10 | 5.18 | 0.477 | 67.4 | -4 | 2.41 | -43.5 | 29.3 | 0.321 | 1.91 | 14.22 | 8417 | 0.024 | 27699 |
| DEEP RIVER | 46.10 | -77.50 | 0.588 | 75.8 | -11 | 3.78 | -72.5 | -98.0 | 0.555 | -12.60 | -76.09 | 17572 | 0.006 | 53437 |
| DENVER | 39.75 | -105.00 | 0.565 | 67.7 | 13 | 2.30 | -54.3 | -131.3 | 0.550 | -8.14 | -113.76 | 8378 | 0.025 | 27391 |
| DEHRA DUN | 30.33 | 78.05 | 0.493 | 44.8 | 0 | 1.11 | -12.0 | 80.9 | 0.440 | 8.20 | 78.84 | 1194 | 0.223 | 5984 |
| DELHI | 28.63 | 77.22 | 0.483 | 42.0 | -0 | 1.08 | -10.4 | 79.8 | 0.431 | 8.20 | 78.01 | 994 | 0.244 | 5319 |
| DECEPCION | -62.98 | -60.72 | 0.416 | -56.1 | 15 | 2.16 | 34.1 | -64.6 | 0.524 | -13.18 | -58.67 | 7069 | 0.031 | 24327 |
| DIXON ISLAND | 73.53 | 80.70 | 0.575 | 84.0 | 26 | 6.90 | -54.2 | 100.6 | 0.611 | 10.10 | 85.33 | 37860 | 0.001 | 108589 |
| DJIBOUTI | 11.55 | 43.15 | 0.363 | 6.2 | 1 | 0.96 | 6.4 | 43.1 | 0.352 | 7.03 | 43.08 | 7 | 0.352 | 574 |
| DJAKARTA | -6.17 | 107.00 | 0.443 | -32.9 | 2 | 1.00 | 24.1 | 107.5 | 0.459 | 8.77 | 107.35 | 552 | 0.308 | 3777 |
| DODAIRA | 36.00 | 139.20 | 0.465 | 49.4 | -6 | 1.24 | -19.3 | 137.6 | 0.508 | 8.99 | 139.53 | 1918 | 0.163 | 8581 |
| DOLGOPRUDNAYA | 55.94 | 37.52 | 0.517 | 71.4 | 10 | 2.59 | -43.0 | 56.2 | 0.392 | 5.57 | 41.40 | 10008 | 0.018 | 31884 |
| DOURBES | 50.10 | 4.60 | 0.472 | 65.8 | -4 | 2.23 | -40.6 | 26.5 | 0.315 | 2.01 | 13.07 | 7194 | 0.030 | 24184 |
| DUNSINK | 53.38 | -6.33 | 0.480 | 68.8 | -11 | 2.74 | -49.9 | 25.0 | 0.329 | -0.23 | 6.06 | 10512 | 0.016 | 33804 |
| DUSHETTI | 42.08 | 44.70 | 0.498 | 60.0 | 7 | 1.54 | -26.2 | 50.6 | 0.360 | 6.21 | 45.24 | 3505 | 0.086 | 13163 |
| DURHAM | 43.08 | -70.92 | 0.570 | 73.2 | -15 | 3.20 | -71.5 | -78.5 | 0.513 | -12.70 | -66.34 | 13808 | 0.009 | 43112 |
| DUMONT D'URVILLE | -66.67 | 140.02 | 0.671 | -89.6 | -70 | 36.22 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| DURBAN | -29.83 | 31.03 | 0.328 | -65.2 | -20 | 1.71 | 45.1 | 19.7 | 0.468 | 4.82 | 23.42 | 4358 | 0.063 | 15787 |
| EDINBURGH | 55.92 | -3.18 | 0.485 | 70.4 | -9 | 3.04 | -52.3 | 30.4 | 0.347 | 0.24 | 9.53 | 12446 | 0.011 | 39244 |
| EIGHTS | -75.23 | -77.17 | 0.534 | -67.1 | 32 | 3.91 | 47.0 | -69.9 | 0.577 | -12.48 | -64.10 | 18368 | 0.005 | 55835 |
| ELLSWORTH | -77.72 | -41.13 | 0.513 | -66.3 | 9 | 4.49 | 50.7 | -59.9 | 0.560 | -11.09 | -48.12 | 21885 | 0.003 | 65813 |
| ELISABETHVILLE | -11.63 | [illegible] | 0.342 | -47.9 | -6 | 1.17 | 31.7 | 24.5 | 0.422 | 7.50 | 25.46 | 1213 | 0.189 | 6131 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** C | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| ENNADAI | 61.30 | -101.20 | 0.613 | 84.2 | 17 | 9.86 | -72.4 | -164.6 | 0.648 | -8.02 | -116.17 | 56632 | 0.000 | 161017 |
| ENUGU | 6.47 | 7.55 | 0.321 | -9.0 | -9 | 0.99 | 13.9 | 6.3 | 0.334 | 8.54 | 7.20 | 27 | 0.319 | 845 |
| ESKDALEMUIR | 55.32 | -3.20 | 0.484 | 70.0 | -9 | 2.95 | -51.4 | 29.4 | 0.341 | 0.41 | 9.22 | 11857 | 0.013 | 37578 |
| ESPERANZA | -63.38 | -56.98 | 0.413 | -56.1 | 13 | 2.20 | 34.7 | -63.2 | 0.523 | -13.08 | -56.51 | 7285 | 0.029 | 24966 |
| EUREKA | 80.00 | -85.93 | 0.571 | 87.5 | 68 | 314.75 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | ** | | |
| FAREWELL | 62.53 | -153.90 | 0.557 | 74.5 | 25 | 4.27 | -53.4 | 168.8 | 0.638 | 3.44 | -172.77 | 21141 | 0.004 | 62592 |
| FANNING ISLAND | 3.92 | -159.38 | 0.333 | 10.7 | 10 | 0.98 | -6.2 | -161.2 | 0.351 | 0.74 | -159.94 | 46 | 0.328 | 1154 |
| FLIN FLON | 54.70 | -102.00 | 0.613 | 80.1 | 15 | 5.54 | -68.2 | -149.4 | 0.628 | -8.37 | -114.22 | 29092 | 0.002 | 84892 |
| FORT YUKON | 66.57 | -145.30 | 0.576 | 78.6 | 33 | 6.45 | -58.8 | 167.1 | 0.654 | 2.68 | -169.36 | 35108 | 0.001 | 101129 |
| FORT NORMAN | 64.90 | -125.50 | 0.596 | 81.3 | 38 | 8.23 | -64.2 | 177.1 | 0.656 | -1.47 | -150.08 | 46413 | 0.001 | 132451 |
| FORT CHIMO | 58.10 | -68.43 | 0.584 | 80.7 | -35 | 8.40 | -85.4 | -83.9 | 0.587 | -11.82 | -58.89 | 46897 | 0.001 | 134933 |
| FORT MONMOUTH | 40.25 | -74.02 | 0.566 | 71.6 | -10 | 2.81 | -68.1 | -85.5 | 0.507 | -12.85 | -71.50 | 11384 | 0.014 | 36267 |
| FORT BELVOIR | 38.73 | -77.13 | 0.565 | 70.6 | -6 | 2.62 | -65.7 | -91.8 | 0.507 | -12.83 | -76.36 | 10214 | 0.017 | 32919 |
| FORT RANDOLPH | 9.38 | -79.88 | 0.390 | 37.8 | 4 | 1.17 | -33.1 | -85.7 | 0.315 | -13.67 | -81.81 | 949 | 0.191 | 5680 |
| FORT DE FRANCE | 14.10 | -61.02 | 0.405 | 44.9 | -9 | 1.32 | -41.5 | -55.2 | 0.271 | -15.20 | -57.03 | 1573 | 0.138 | 8075 |
| FREETOWN | 8.47 | -13.22 | 0.307 | 6.0 | -14 | 1.02 | 3.2 | -11.8 | 0.297 | 3.61 | -11.90 | 5 | 0.297 | 511 |
| FROBISHER | 63.75 | -68.57 | 0.582 | 82.7 | -46 | 14.83 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | ** | | |
| FREIBURG | 48.05 | 7.58 | 0.468 | 63.9 | -3 | 2.01 | -36.5 | 26.0 | 0.316 | 2.93 | 14.65 | 5942 | 0.041 | 20519 |
| FRONT ROYAL | 38.93 | -78.18 | 0.567 | 70.8 | -5 | 2.64 | -65.6 | -94.1 | 0.512 | -13.01 | -77.91 | 10339 | 0.017 | 33247 |
| FT. DAVIS | 30.63 | -103.95 | 0.512 | 58.7 | 11 | 1.65 | -45.7 | -122.2 | 0.483 | -8.42 | -110.58 | 4258 | 0.067 | 15760 |
| GARCHY | 47.30 | 3.07 | 0.464 | 63.4 | -5 | 1.98 | -36.6 | 22.6 | 0.313 | 2.46 | 10.93 | 5803 | 0.042 | 20149 |
| GAINESVILLE | 29.63 | -82.30 | 0.525 | 62.4 | 1 | 1.82 | -54.5 | -96.6 | 0.455 | -12.85 | -84.46 | 5192 | 0.050 | 18620 |
| GENOVA MONTE CAPEL | 44.55 | 8.95 | 0.458 | 60.5 | -3 | 1.73 | -30.7 | 23.5 | 0.321 | 3.67 | 14.72 | 4392 | 0.061 | 15957 |
| GENERAL BELGRANO | -77.97 | -38.80 | 0.513 | -66.4 | 7 | 4.59 | 51.2 | -59.3 | 0.560 | -11.03 | -47.21 | 22518 | 0.003 | 67578 |
| GENERAL SAN MARTIN | -68.13 | -67.43 | 0.469 | -60.8 | 22 | 2.65 | 39.2 | -67.2 | 0.550 | -12.81 | -61.47 | 10288 | 0.016 | 33351 |
| GHANA | 10.00 | 4.00 | 0.323 | 0.6 | -9 | 0.99 | 9.5 | 4.1 | 0.322 | NO MINIMUM B BETWEEN INTERS. | | | | 57 |
| GIFU | 35.58 | 137.08 | 0.469 | 49.3 | -6 | 1.23 | -18.9 | 135.8 | 0.507 | 9.07 | 137.52 | 1864 | 0.167 | 8397 |
| GILGIT | 35.94 | 74.30 | 0.521 | 53.7 | 1 | 1.26 | -18.4 | 78.5 | 0.450 | 7.98 | 75.11 | 2103 | 0.152 | 8830 |
| GOUGH ISLAND | -40.35 | -9.89 | 0.279 | -57.5 | -27 | 1.70 | 34.7 | -34.5 | 0.445 | -5.31 | -23.04 | 4000 | 0.064 | 15275 |
| GODHAVN | 69.23 | -53.52 | 0.557 | 81.6 | -52 | 20.97 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | ** | | |
| GOOSE BAY | 53.32 | -60.38 | 0.565 | 76.9 | -31 | 5.33 | -80.2 | -39.9 | 0.532 | -11.05 | -48.01 | 27230 | 0.002 | 80636 |
| GOTTINGEN | 51.53 | 9.93 | 0.478 | 66.9 | -2 | 2.30 | -41.3 | 31.4 | 0.322 | 2.77 | 17.61 | 7754 | 0.027 | 25749 |
| GRYTVIKEN | -54.27 | -36.50 | 0.318 | -50.9 | -5 | 1.82 | 30.4 | -54.0 | 0.479 | -11.64 | -44.90 | 4717 | 0.053 | 17651 |
| GRAZ | 47.07 | 15.47 | 0.470 | 63.0 | -0 | 1.86 | -33.3 | 29.9 | 0.323 | 4.08 | 20.54 | 5227 | 0.049 | 18369 |
| GROCKA | 44.63 | 20.77 | 0.468 | 60.6 | 1 | 1.68 | -29.1 | 31.5 | 0.330 | 4.94 | 24.23 | 4190 | 0.066 | 15286 |
| GRAND BAHAMA | 26.67 | -78.37 | 0.506 | 59.9 | -0 | 1.69 | -53.0 | -89.3 | 0.423 | -13.32 | -79.32 | 4309 | 0.062 | 16140 |
| GRAHAMSTOWN | -33.28 | 26.48 | 0.320 | -66.3 | -24 | 1.84 | 46.5 | 10.9 | 0.465 | 3.79 | 16.77 | 5113 | 0.051 | 18062 |
| GREAT WHALE RIVER | 55.27 | -77.78 | 0.600 | 81.1 | -21 | 6.99 | -80.1 | -115.6 | 0.601 | -11.99 | -75.48 | 38020 | 0.001 | 110131 |
| GULMARG | 34.05 | 74.40 | 0.511 | 51.0 | 1 | 1.21 | -16.4 | 78.2 | 0.444 | 7.86 | 75.22 | 1767 | 0.174 | 7809 |
| GUANTANAMO BAY | 19.90 | -75.15 | 0.461 | 52.9 | -0 | 1.44 | -47.0 | -82.1 | 0.365 | -14.19 | -75.55 | 2640 | 0.102 | 11249 |
| GUAM | 13.45 | 144.75 | 0.364 | 11.9 | 1 | 0.96 | 1.8 | 144.3 | 0.379 | 8.83 | 144.60 | 66 | 0.353 | 1313 |
| GUAYAQUIL | -2.17 | -79.88 | 0.323 | 17.9 | 5 | 1.05 | -20.5 | -82.3 | 0.284 | -13.90 | -81.20 | 155 | 0.267 | 2131 |
| HAMMAGHIR | 30.10 | 0. | 0.397 | 42.4 | -7 | 1.19 | -13.3 | 8.8 | 0.322 | 5.63 | 4.26 | 1210 | 0.179 | 5218 |
| HACHIJOJIMA | 33.13 | 139.80 | 0.447 | 45.6 | -5 | 1.18 | -16.7 | 138.4 | 0.489 | 8.86 | 140.03 | 1492 | 0.192 | 7257 |
| HALLETT | -72.32 | 170.22 | 0.664 | -84.9 | -77 | 21.59 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | ** | | |
| HARTLAND | 51.00 | -4.48 | 0.473 | 66.9 | -9 | 2.43 | -45.3 | 22.7 | 0.315 | 0.51 | 6.48 | 8488 | 0.023 | 28003 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** GEOGRAPHIC | | | GEOMAGNETIC | | L | ** CONJUGATE INTERS. ** | | | MINIMUM-B EQUATOR | | | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| HARVSTVA | 60.22 | 10.25 | 0.496 | 72.9 | -2 | 3.52 | -53.6 | 44.5 | 0.386 | 2.00 | 21.71 | 15632 | 0.007 | 48035 |
| HAMBURG | 53.63 | 10.00 | 0.482 | 68.5 | -2 | 2.52 | -44.5 | 34.1 | 0.330 | 2.39 | 18.47 | 9176 | 0.020 | 29826 |
| HALLE | 51.48 | 11.93 | 0.479 | 66.9 | -1 | 2.28 | -40.8 | 32.5 | 0.323 | 2.96 | 19.15 | 7624 | 0.028 | 25357 |
| HALIFAX | 44.60 | -63.60 | 0.557 | 72.8 | -22 | 3.33 | -72.9 | -56.5 | 0.489 | -12.04 | -55.07 | 14506 | 0.008 | 45219 |
| HANNOVER USA | 43.70 | -72.30 | 0.574 | 73.8 | -14 | 3.31 | -71.8 | -82.6 | 0.523 | -12.84 | -68.35 | 14534 | 0.008 | 45105 |
| HABANA | 23.15 | -82.35 | 0.484 | 55.5 | 3 | 1.51 | -47.4 | -93.9 | 0.406 | -12.82 | -84.74 | 3186 | 0.088 | 12780 |
| HALLEY BAY | -75.52 | -26.60 | 0.486 | -64.6 | -1 | 4.17 | 50.5 | -55.0 | 0.548 | -10.62 | -41.38 | 19810 | 0.004 | 60117 |
| HAIFA | 32.83 | 35.10 | 0.443 | 46.7 | 4 | 1.21 | -14.3 | 37.0 | 0.346 | 6.91 | 35.23 | 1462 | 0.174 | 6941 |
| HAMILTON MASS. | 42.02 | -72.17 | 0.569 | 72.6 | -13 | 3.05 | -70.2 | -81.5 | 0.511 | -12.67 | -68.42 | 12857 | 0.011 | 40427 |
| HERSTMONCEUX | 50.90 | 0.33 | 0.473 | 66.6 | -7 | 2.35 | -43.3 | 25.1 | 0.315 | 1.51 | 10.06 | 7990 | 0.026 | 26518 |
| HEISS | 80.20 | 57.48 | 0.554 | 84.1 | 25 | 13.32 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| HEALY | 63.85 | -119.00 | 0.602 | 82.1 | 37 | 8.64 | -66.1 | -178.4 | 0.655 | -3.16 | -142.01 | 49022 | 0.000 | 139719 |
| HEL | 54.60 | 18.80 | 0.491 | 69.4 | 2 | 2.54 | -44.0 | 40.9 | 0.344 | 3.38 | 25.64 | 9439 | 0.020 | 30487 |
| HELWAN | 29.87 | 31.33 | 0.423 | 41.3 | 2 | 1.14 | -10.2 | 32.7 | 0.344 | 7.55 | 31.53 | 1024 | 0.209 | 5486 |
| HERMANUS | -34.42 | 19.22 | 0.312 | -66.0 | -26 | 1.84 | 45.4 | 0.4 | 0.458 | 2.44 | 8.27 | 5082 | 0.050 | 18058 |
| HIRAISO | 36.37 | 140.62 | 0.463 | 49.6 | -6 | 1.25 | -19.6 | 138.8 | 0.509 | 8.92 | 140.86 | 1969 | 0.160 | 8750 |
| HIGHCLIFF | -45.88 | 170.58 | 0.608 | -71.1 | 22 | 2.74 | 55.9 | -162.4 | 0.520 | 4.28 | -175.79 | 11262 | 0.015 | 35306 |
| HONOLULU | 21.30 | -158.10 | 0.363 | 39.1 | 11 | 1.14 | -20.9 | -166.7 | 0.430 | 1.51 | -161.94 | 1018 | 0.213 | 5787 |
| HOBART | -42.92 | 147.17 | 0.632 | -73.0 | 13 | 2.85 | 60.7 | 161.0 | 0.541 | 8.35 | 155.18 | 12117 | 0.014 | 37472 |
| HOLLANDIA | -2.50 | 140.52 | 0.400 | -20.7 | 3 | 0.98 | 17.9 | 141.2 | 0.377 | 8.75 | 141.05 | 215 | 0.333 | 2373 |
| HURBANOVO | 47.90 | 18.20 | 0.475 | 63.8 | 1 | 1.92 | -34.2 | 32.6 | 0.325 | 4.17 | 22.96 | 5534 | 0.046 | 19250 |
| HUMAIN | 50.20 | 5.35 | 0.472 | 65.9 | -4 | 2.23 | -40.5 | 27.1 | 0.316 | 2.14 | 13.67 | 7207 | 0.030 | 24214 |
| HUANCAYO | -12.05 | -75.33 | 0.283 | 0.7 | 5 | 1.04 | -12.8 | -75.4 | 0.282 | NO MINIMUM B BETWEEN INTERS. | | | | 79 |
| HYDERABAD | 17.42 | 78.45 | 0.424 | 19.1 | -1 | 0.94 | 1.4 | 79.5 | 0.402 | 8.46 | 78.93 | 153 | 0.369 | 1846 |
| IBADAN | 7.37 | 3.97 | 0.318 | -5.5 | -10 | 1.00 | 11.9 | 3.1 | 0.326 | 7.89 | 3.87 | 5 | 0.318 | 515 |
| I. CROZET | -46.50 | 52.00 | 0.384 | -64.8 | -40 | 2.88 | 57.8 | 28.6 | 0.507 | 4.31 | 34.69 | 11752 | 0.013 | 36916 |
| IL CORTI | 36.22 | 14.30 | 0.431 | 50.2 | -1 | 1.31 | -17.8 | 21.5 | 0.336 | 6.24 | 17.24 | 1992 | 0.135 | 8663 |
| INUVIK | 68.20 | -133.70 | 0.588 | 81.5 | 40 | 9.29 | -63.2 | 168.2 | 0.661 | 1.04 | -161.55 | 53249 | 0.000 | 151229 |
| INVERCARGILL | -46.42 | 168.32 | 0.614 | -71.9 | 22 | 2.87 | 57.3 | -164.5 | 0.524 | 4.78 | -177.99 | 12139 | 0.013 | 37724 |
| INVERNESS | 57.45 | -4.25 | 0.488 | 71.4 | -10 | 3.32 | -54.9 | 32.4 | 0.362 | -0.16 | 9.50 | 14279 | 0.009 | 44418 |
| IQUITOS | -3.67 | -73.33 | 0.313 | 17.4 | 2 | 1.07 | -22.0 | -74.7 | 0.271 | -15.83 | -74.05 | 142 | 0.258 | 2107 |
| IRKUTSK | 52.27 | 104.30 | 0.602 | 71.8 | -3 | 2.04 | -33.7 | 108.0 | 0.587 | 9.77 | 105.51 | 7167 | 0.036 | 23303 |
| ISLA DE PASCUA | -27.17 | -109.43 | 0.353 | -36.7 | 14 | 1.14 | 13.1 | -102.1 | 0.393 | -8.20 | -105.40 | 875 | 0.211 | 5349 |
| ISFJORD | 78.07 | 13.63 | 0.534 | 81.5 | -4 | 14.50 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| ITHACA | 42.45 | -76.52 | 0.577 | 73.3 | -9 | 3.12 | -69.5 | -92.6 | 0.530 | -12.66 | -75.00 | 13367 | 0.010 | 41749 |
| IVALO | 68.60 | 27.48 | 0.521 | 77.8 | 8 | 5.54 | -57.8 | 68.3 | 0.491 | 4.49 | 40.02 | 28755 | 0.002 | 84222 |
| JICAMARCA | -11.95 | -76.87 | 0.286 | 0.3 | 6 | 1.03 | -12.2 | -76.9 | 0.285 | NO MINIMUM B BETWEEN INTERS. | | | | 29 |
| JODRELL BANK | 53.23 | -2.30 | 0.479 | 68.5 | -8 | 2.64 | -47.9 | 26.8 | 0.326 | 0.52 | 9.03 | 9912 | 0.018 | 32052 |
| JOHANNESBURG | -26.20 | 28.03 | 0.331 | -63.5 | -17 | 1.57 | 42.5 | 18.3 | 0.458 | 5.35 | 21.68 | 3510 | 0.081 | 13270 |
| JUPITER | 27.02 | -80.12 | 0.509 | 60.1 | 0 | 1.70 | -52.6 | -92.2 | 0.430 | -13.19 | -81.67 | 4365 | 0.062 | 16272 |
| JULIANEHAAB | 60.72 | -46.03 | 0.541 | 77.3 | -37 | 7.31 | -79.0 | 18.0 | 0.523 | -8.02 | -25.60 | 39729 | 0.001 | 115387 |
| JULIUSRUH-RUGEN | 54.63 | 13.38 | 0.487 | 69.3 | -0 | 2.60 | -45.2 | 37.5 | 0.338 | 2.78 | 21.45 | 9730 | 0.018 | 31369 |
| JUNGFRAUJOCH | 46.55 | 7.99 | 0.463 | 62.5 | -3 | 1.87 | -34.0 | 24.7 | 0.317 | 3.23 | 14.51 | 5240 | 0.049 | 18455 |
| KANOYA | 31.42 | 130.89 | 0.462 | 44.7 | -4 | 1.14 | -15.2 | 130.2 | 0.484 | 8.78 | 131.33 | 1317 | 0.211 | 6620 |
| KARACHI | 24.85 | 67.02 | 0.452 | 36.4 | -0 | 1.04 | -8.1 | 69.3 | 0.396 | 7.09 | 67.73 | 680 | 0.272 | 4238 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** C | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| KAZACHIE | 70.70 | 136.40 | 0.584 | 81.2 | -11 | 5.20 | -50.3 | 129.0 | 0.660 | 10.52 | 131.91 | 27181 | 0.002 | 78832 |
| KAP TOBIN | 70.42 | -21.97 | 0.523 | 78.8 | -29 | 10.94 | -72.6 | 60.3 | 0.535 | -2.25 | 6.88 | 63028 | 0.000 | 179616 |
| KAZAN | 55.83 | 48.82 | 0.536 | 72.4 | 13 | 2.55 | -41.5 | 65.1 | 0.429 | 6.44 | 51.40 | 9862 | 0.019 | 31326 |
| KAKIOKA | 36.23 | 140.18 | 0.463 | 49.5 | -6 | 1.25 | -19.5 | 138.5 | 0.509 | 9.09 | 140.46 | 1948 | 0.161 | 8684 |
| KAMPALA | 0.33 | 32.58 | 0.341 | -24.2 | -1 | 1.00 | 20.3 | 32.5 | 0.381 | 8.39 | 32.41 | 234 | 0.306 | 2346 |
| KEKAHA | 21.84 | -159.72 | 0.363 | 39.5 | 12 | 1.14 | -20.8 | -168.4 | 0.433 | 1.80 | -163.64 | 1044 | 0.211 | 5879 |
| KHARTOUM | 15.58 | 32.58 | 0.364 | 12.3 | 1 | 0.97 | 5.3 | 32.6 | 0.343 | 8.62 | 32.53 | 55 | 0.337 | 1160 |
| KHABAROVSK | 48.52 | 135.12 | 0.543 | 64.0 | -10 | 1.73 | -30.5 | 133.1 | 0.585 | 9.54 | 135.70 | 5053 | 0.060 | 17617 |
| KHARKOV | 50.00 | 36.23 | 0.504 | 66.8 | 8 | 2.02 | -35.8 | 48.8 | 0.356 | 5.42 | 38.68 | 6385 | 0.038 | 21590 |
| KIEL | 54.30 | 10.10 | 0.484 | 69.0 | -2 | 2.59 | -45.5 | 35.1 | 0.334 | 2.30 | 18.83 | 9677 | 0.019 | 31254 |
| KIRUNA | 67.83 | 20.43 | 0.515 | 77.1 | 4 | 5.43 | -58.7 | 63.6 | 0.477 | 3.48 | 34.27 | 27988 | 0.002 | 82212 |
| KING SALMON | 58.70 | -156.70 | 0.540 | 71.2 | 22 | 3.31 | -49.7 | 171.3 | 0.622 | 3.76 | -172.61 | 14956 | 0.009 | 45526 |
| KIEV | 50.45 | 30.50 | 0.496 | 66.7 | 6 | 2.07 | -36.7 | 44.5 | 0.345 | 4.98 | 33.82 | 6618 | 0.036 | 22307 |
| KINGSTON | 18.00 | -76.80 | 0.449 | 50.4 | 0 | 1.38 | -44.2 | -84.2 | 0.357 | -14.07 | -77.86 | 2236 | 0.117 | 9978 |
| KNOB LAKE | 54.80 | -66.82 | 0.580 | 78.9 | -31 | 6.35 | -82.6 | -68.9 | 0.566 | -11.60 | -57.35 | 33778 | 0.001 | 98654 |
| KOROR ISLAND | 7.16 | 123.48 | 0.392 | -0.8 | 2 | 0.93 | 7.9 | 123.5 | 0.392 | 7.75 | 123.50 | 0 | 0.392 | 83 |
| KOTZEBUE | 66.88 | -162.60 | 0.561 | 76.6 | 22 | 5.19 | -54.5 | 160.0 | 0.652 | 5.19 | 177.60 | 27084 | 0.002 | 78925 |
| KOLN | 50.93 | 6.92 | 0.475 | 66.5 | -3 | 2.28 | -41.2 | 28.8 | 0.318 | 2.43 | 15.09 | 7551 | 0.028 | 25190 |
| KOMURO | 35.98 | 139.62 | 0.464 | 49.3 | -6 | 1.24 | -19.3 | 138.0 | 0.508 | 8.96 | 139.92 | 1912 | 0.164 | 8566 |
| KOKUBUNJI | 35.70 | 139.48 | 0.462 | 49.0 | -6 | 1.23 | -19.0 | 137.9 | 0.506 | 9.02 | 139.79 | 1868 | 0.166 | 8431 |
| KODAIKANAL | 10.23 | 77.48 | 0.401 | 2.2 | -3 | 0.92 | 8.5 | 77.6 | 0.399 | NO MINIMUM B BETWEEN INTERS. | | | | 195 |
| KUHLUNGSBORN | 54.12 | 11.93 | 0.485 | 68.9 | -1 | 2.55 | -44.8 | 36.0 | 0.334 | 2.79 | 20.11 | 9425 | 0.020 | 30512 |
| KUMASI | 6.67 | -1.58 | 0.312 | -4.4 | -12 | 1.00 | 10.3 | -2.4 | 0.318 | NO MINIMUM B BETWEEN INTERS. | | | | 419 |
| KYOTO | 35.02 | 135.78 | 0.469 | 48.8 | -6 | 1.22 | -18.4 | 134.7 | 0.504 | 9.01 | 136.25 | 1785 | 0.173 | 8144 |
| L'AQUILA | 42.40 | 13.32 | 0.454 | 58.0 | -1 | 1.58 | -26.7 | 24.6 | 0.328 | 4.78 | 17.64 | 3553 | 0.079 | 13428 |
| LA MADDALENA | 41.22 | 9.40 | 0.447 | 56.8 | -3 | 1.54 | -25.6 | 21.2 | 0.327 | 4.71 | 14.21 | 3280 | 0.085 | 12628 |
| LAHORE | 31.55 | 74.33 | 0.497 | 47.2 | 0 | 1.14 | -13.8 | 77.6 | 0.435 | 7.88 | 75.15 | 1386 | 0.203 | 6614 |
| LA PLATA | -34.90 | -57.90 | 0.255 | -32.6 | 0 | 1.20 | 7.6 | -61.8 | 0.366 | -16.34 | -58.98 | 854 | 0.181 | 5556 |
| LA QUIACA | -22.10 | -65.60 | 0.255 | -15.2 | 1 | 1.08 | -5.1 | -65.9 | 0.300 | -17.51 | -65.55 | 106 | 0.249 | 1943 |
| LA PAZ | -16.48 | -68.05 | 0.265 | -5.7 | 1 | 1.06 | -10.4 | -68.0 | 0.281 | NO MINIMUM B BETWEEN INTERS. | | | | 682 |
| LAE | -6.72 | 147.00 | 0.416 | -28.3 | 5 | 1.02 | 22.3 | 148.6 | 0.375 | 8.96 | 148.20 | 439 | 0.293 | 3528 |
| LA GRAU | 43.10 | 6.00 | 0.452 | 59.0 | -4 | 1.66 | -29.2 | 20.5 | 0.321 | 3.65 | 12.01 | 3970 | 0.069 | 14722 |
| LA HAYE | 52.10 | 4.30 | 0.477 | 67.4 | -5 | 2.42 | -43.8 | 28.8 | 0.320 | 1.82 | 13.54 | 8481 | 0.023 | 27890 |
| LEEDS | 53.80 | -1.55 | 0.480 | 68.9 | -8 | 2.70 | -48.5 | 28.0 | 0.329 | 0.77 | 9.80 | 10296 | 0.016 | 33135 |
| LEICESTER | 52.62 | -1.10 | 0.477 | 68.0 | -8 | 2.55 | -46.5 | 26.6 | 0.322 | 0.76 | 9.70 | 9315 | 0.020 | 30336 |
| LERWICK | 60.13 | -1.18 | 0.493 | 73.0 | -9 | 3.78 | -57.1 | 38.6 | 0.388 | 0.24 | 13.24 | 17238 | 0.006 | 52666 |
| LENINGRAD | 59.95 | 30.70 | 0.513 | 73.5 | 9 | 3.20 | -48.6 | 56.4 | 0.408 | 4.63 | 37.28 | 13807 | 0.010 | 42650 |
| LEIDSCHENDAM | 52.08 | 4.38 | 0.477 | 67.4 | -5 | 2.41 | -43.8 | 28.8 | 0.320 | 1.82 | 13.60 | 8461 | 0.023 | 27833 |
| LEOPOLDVILLE | -4.37 | 15.25 | 0.330 | -34.8 | -9 | 1.07 | 25.1 | 11.5 | 0.379 | 8.20 | 13.34 | 531 | 0.251 | 3710 |
| LINDAU,HARZ | 51.65 | 10.13 | 0.478 | 67.0 | -2 | 2.31 | -41.5 | 31.6 | 0.322 | 2.86 | 17.79 | 7820 | 0.027 | 25933 |
| LISBOA | 38.77 | -9.13 | 0.435 | 55.6 | -10 | 1.56 | -28.4 | 8.4 | 0.309 | 1.63 | -1.00 | 3279 | 0.083 | 12783 |
| LITTLE AMERICA | -78.18 | -162.17 | 0.642 | -80.2 | -78 | 13.10 | ** NO | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| LOGRONO | 42.45 | -2.50 | 0.448 | 58.9 | -7 | 1.69 | -31.0 | 15.0 | 0.313 | 2.41 | 5.19 | 4102 | 0.065 | 15185 |
| LOVOZERO | 67.99 | 35.08 | 0.528 | 77.9 | 13 | 5.15 | -55.8 | 71.0 | 0.495 | 5.54 | 45.23 | 26306 | 0.002 | 77316 |
| LONGYEARBYEN | 78.22 | 15.67 | 0.534 | 81.6 | -2 | 14.42 | ** NO | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| LONDON | 51.53 | 0.10 | 0.475 | 67.1 | -7 | 2.41 | -44.3 | 25.8 | 0.317 | 1.13 | 10.17 | 8425 | 0.023 | 27776 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| LOMNICKY STIT | 49.20 | 20.22 | 0.480 | 65.1 | 2 | 2.03 | -35.9 | 35.4 | 0.327 | 4.35 | 24.94 | 6112 | 0.040 | 20913 |
| LOURENCO MARQUES | -25.97 | 32.60 | 0.335 | -63.0 | -16 | 1.56 | 42.5 | 24.4 | 0.465 | 5.51 | 26.84 | 3491 | 0.082 | 13191 |
| LUND | 55.70 | 13.18 | 0.489 | 70.1 | -0 | 2.73 | -46.8 | 39.0 | 0.345 | 2.76 | 21.72 | 10614 | 0.016 | 33881 |
| LUANDA | -8.82 | 13.22 | 0.329 | -42.2 | -12 | 1.13 | 28.2 | 7.4 | 0.391 | 7.28 | 10.22 | 862 | 0.213 | 4970 |
| LULEA | 65.60 | 22.12 | 0.512 | 76.1 | 5 | 4.61 | -56.3 | 60.3 | 0.453 | 3.80 | 33.78 | 22759 | 0.003 | 67700 |
| LVOV | 49.82 | 24.02 | 0.486 | 65.8 | 3 | 2.05 | -36.4 | 38.8 | 0.333 | 4.48 | 28.23 | 6355 | 0.038 | 21596 |
| LWIRO | -2.25 | 28.80 | 0.340 | -30.7 | -2 | 1.03 | 23.4 | 28.1 | 0.388 | 8.57 | 28.28 | 397 | 0.279 | 3120 |
| LYCKSELE | 64.62 | 18.67 | 0.508 | 75.5 | 2 | 4.40 | -56.2 | 56.8 | 0.439 | 3.16 | 30.59 | 21357 | 0.004 | 63861 |
| MAKATEA | -16.20 | -148.20 | 0.373 | -26.5 | 12 | 1.04 | 11.0 | -143.3 | 0.342 | -1.68 | -145.41 | 388 | 0.275 | 3316 |
| MANILA | 14.52 | 121.00 | 0.403 | 15.1 | 0 | 0.94 | 1.0 | 120.6 | 0.405 | 7.95 | 120.88 | 101 | 0.375 | 1542 |
| MALVERN | 52.12 | -2.32 | 0.476 | 67.7 | -8 | 2.51 | -46.2 | 25.3 | 0.319 | 0.82 | 8.54 | 9066 | 0.021 | 29634 |
| MAJURO ISLAND | 7.08 | 171.13 | 0.340 | 5.5 | 10 | 0.97 | 1.7 | 170.2 | 0.353 | 6.92 | 171.10 | 2 | 0.340 | 604 |
| MADRID | 40.40 | -3.68 | 0.440 | 56.8 | -8 | 1.59 | -28.4 | 12.7 | 0.314 | 2.64 | 3.69 | 3490 | 0.078 | 13362 |
| MACAO | 22.20 | 113.55 | 0.443 | 30.1 | 0 | 0.99 | -5.3 | 112.9 | 0.436 | 8.42 | 113.41 | 445 | 0.322 | 3363 |
| MADRAS | 13.08 | 80.28 | 0.410 | 8.5 | -2 | 0.92 | 6.1 | 80.7 | 0.401 | 8.62 | 80.53 | 27 | 0.396 | 780 |
| MAWSON | -67.40 | 62.50 | 0.515 | -69.5 | -56 | 8.63 | 70.8 | -4.6 | 0.516 | 0.35 | 19.85 | 48277 | 0.000 | 138656 |
| MACQUARIE ISLAND | -54.30 | 158.60 | 0.653 | -79.1 | 26 | 5.25 | 67.3 | -164.8 | 0.561 | 5.44 | 175.72 | 27381 | 0.002 | 79731 |
| MARION ISLAND | -46.85 | 37.87 | 0.343 | -64.6 | -35 | 2.71 | 55.5 | 11.8 | 0.487 | 2.50 | 20.61 | 10553 | 0.016 | 33724 |
| MAUI,KIHEI | 20.80 | -156.50 | 0.363 | 38.8 | 11 | 1.13 | -21.0 | -164.9 | 0.427 | 1.05 | -160.31 | 995 | 0.215 | 5705 |
| MCMURDO SOUND | -77.85 | 166.62 | 0.655 | -83.3 | -36 | 34.48 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MEANCOK | 54.62 | -113.33 | 0.603 | 77.8 | 24 | 4.66 | -62.9 | -158.0 | 0.627 | -5.57 | -128.91 | 23520 | 0.003 | 69351 |
| MEUDON | 48.80 | 2.25 | 0.468 | 64.8 | -6 | 2.17 | -39.2 | 23.7 | 0.312 | 2.06 | 10.79 | 6612 | 0.035 | 22516 |
| MEMAMBETSU | 43.92 | 144.20 | 0.495 | 57.6 | -8 | 1.50 | -26.6 | 140.9 | 0.555 | 9.18 | 144.11 | 3525 | 0.093 | 13369 |
| MEXICO EL CERRILLO | 19.32 | -99.55 | 0.439 | 46.0 | 9 | 1.27 | -35.2 | -110.4 | 0.392 | -9.10 | -103.92 | 1759 | 0.149 | 8323 |
| MELBOURNE | -37.82 | 144.32 | 0.614 | -69.2 | 10 | 2.26 | 55.8 | 153.0 | 0.533 | 8.88 | 150.25 | 8324 | 0.027 | 26916 |
| MIDWAY ISLAND | 6.97 | 158.22 | 0.350 | 0.4 | 6 | 0.96 | 6.6 | 158.2 | 0.351 | NO MINIMUM B BETWEEN INTERS. | | | | 41 |
| MIEDZESZYN | 52.17 | 21.20 | 0.488 | 67.6 | 3 | 2.27 | -40.1 | 39.4 | 0.335 | 4.17 | 26.63 | 7717 | 0.028 | 25538 |
| MINNEAPOLIS | 44.97 | -93.23 | 0.596 | 74.3 | 6 | 3.28 | -64.6 | -124.3 | 0.578 | -10.47 | -99.66 | 14584 | 0.009 | 44807 |
| MIRNY | -66.57 | 92.92 | 0.599 | -76.8 | -75 | 19.55 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MINA AGUILAR | -23.10 | -65.70 | 0.255 | -16.8 | 2 | 1.08 | -4.1 | -66.0 | 0.304 | -17.44 | -65.62 | 141 | 0.246 | 2181 |
| MOULD BAY | 76.20 | -119.40 | 0.585 | 87.5 | 71 | 37.32 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MOSHIRI | 44.37 | 142.27 | 0.503 | 58.4 | -8 | 1.52 | -26.9 | 139.3 | 0.559 | 9.25 | 142.37 | 3661 | 0.090 | 13739 |
| MOCA | 3.35 | 8.67 | 0.320 | -16.6 | -9 | 1.00 | 17.0 | 6.5 | 0.344 | 8.41 | 7.80 | 105 | 0.306 | 1581 |
| MOSCOW | 55.47 | 37.32 | 0.516 | 71.1 | 10 | 2.54 | -42.4 | 55.5 | 0.388 | 5.39 | 41.10 | 9660 | 0.019 | 30905 |
| MOUNT WASHINGTON | 44.27 | -71.30 | 0.573 | 74.0 | -15 | 3.40 | -72.5 | -80.1 | 0.522 | -12.68 | -66.72 | 15094 | 0.008 | 46685 |
| MOUNT NORIKURA | 36.12 | 137.55 | 0.470 | 49.9 | -6 | 1.24 | -19.4 | 136.2 | 0.509 | 8.93 | 137.97 | 1951 | 0.162 | 8660 |
| MONT JOLI | 48.60 | -68.20 | 0.576 | 76.1 | -22 | 4.26 | -76.9 | -72.0 | 0.537 | -12.08 | -61.09 | 20491 | 0.004 | 61775 |
| MURCHISON BAY | 80.05 | 18.30 | 0.539 | 82.5 | -1 | 17.28 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MURMANSK | 68.97 | 33.08 | 0.527 | 78.2 | 12 | 5.56 | -57.0 | 71.6 | 0.502 | 5.20 | 44.48 | 28911 | 0.002 | 84559 |
| MUNCHEN | 48.13 | 11.70 | 0.470 | 64.0 | -1 | 1.98 | -35.6 | 28.6 | 0.319 | 3.45 | 17.88 | 5818 | 0.042 | 20124 |
| NARSSARSSUAQ | 61.18 | -45.42 | 0.541 | 77.4 | -38 | 7.50 | -78.9 | 20.5 | 0.524 | -7.80 | -24.59 | 40947 | 0.001 | 118757 |
| NARYAN MAR | 67.50 | 53.00 | 0.549 | 79.1 | 21 | 4.76 | -52.3 | 80.1 | 0.526 | 7.28 | 59.32 | 23990 | 0.003 | 70604 |
| NATAL | -5.33 | -35.12 | 0.272 | -4.4 | -18 | 1.05 | -1.3 | -36.5 | 0.283 | NO MINIMUM B BETWEEN INTERS. | | | | 476 |
| NAIROBI | -1.28 | 36.80 | 0.343 | -26.4 | -0 | 1.01 | 20.8 | 36.9 | 0.390 | 7.86 | 36.67 | 289 | 0.300 | 2623 |
| NEUSTRELITZ | 53.28 | -13.08 | 0.482 | 69.1 | -14 | 2.88 | -53.0 | 21.4 | 0.336 | -1.45 | 0.84 | 11413 | 0.013 | 36435 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** G | R | E | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| NIAMEY | 13.50 | 2.50 | 0.330 | 9.2 | -9 | 1.00 | 5.6 | 4.0 | 0.316 | 7.75 | 3.56 | 29 | 0.314 | 900 |
| NITSANIM | 31.73 | 34.60 | 0.437 | 44.9 | 3 | 1.18 | -12.9 | 36.2 | 0.346 | 7.17 | 34.69 | 1297 | 0.186 | 6403 |
| NIIGATA | 37.70 | 138.82 | 0.476 | 51.6 | -6 | 1.29 | -20.8 | 137.2 | 0.519 | 9.14 | 139.21 | 2208 | 0.147 | 9459 |
| NICOSIA | 35.17 | 33.28 | 0.450 | 49.9 | 4 | 1.27 | -16.9 | 36.1 | 0.345 | 6.75 | 33.70 | 1825 | 0.150 | 8098 |
| NOUVELLE AMSTERDAM | -37.84 | 77.57 | 0.486 | -67.7 | -36 | 2.32 | 54.1 | 65.5 | 0.565 | 7.72 | 66.95 | 8628 | 0.025 | 27623 |
| NOVOLAZAREVSKAYA | -70.77 | 11.85 | 0.449 | -64.0 | -25 | 4.61 | 56.3 | -37.4 | 0.519 | -6.64 | -18.81 | 22445 | 0.003 | 67498 |
| NORC | 81.60 | -16.67 | 0.544 | 83.3 | -34 | 37.39 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| NORWAY STATION | -70.50 | -2.53 | 0.439 | -62.7 | -17 | 3.93 | 52.2 | -43.5 | 0.524 | -7.90 | -27.03 | 18159 | 0.005 | 55583 |
| NORFOLK ISLAND | -29.00 | 167.60 | 0.528 | -56.4 | 14 | 1.49 | 40.8 | -179.6 | 0.422 | 6.09 | 174.51 | 3288 | 0.096 | 12894 |
| NOUMEA | -22.30 | -166.40 | 0.438 | -41.3 | 13 | 1.16 | 22.8 | -157.1 | 0.369 | 1.37 | -161.34 | 1177 | 0.200 | 6340 |
| NURMIJARVI | 60.50 | 24.65 | 0.507 | 73.5 | 6 | 3.36 | -50.4 | 53.3 | 0.402 | 4.11 | 32.72 | 14727 | 0.008 | 45308 |
| ODESSA | 46.78 | 30.88 | 0.487 | 63.4 | 5 | 1.80 | -31.7 | 41.2 | 0.339 | 5.47 | 33.25 | 4961 | 0.054 | 17497 |
| O'HIGGINS RISCPATR | -63.32 | -57.90 | 0.414 | -56.1 | 14 | 2.19 | 34.6 | -63.6 | 0.523 | -13.12 | -57.03 | 7247 | 0.029 | 24852 |
| OKINAWA | 26.50 | 128.00 | 0.442 | 37.6 | -2 | 1.06 | -10.7 | 127.4 | 0.456 | 8.38 | 128.21 | 803 | 0.264 | 4847 |
| OLENEK | 68.50 | 112.40 | 0.597 | 82.6 | -6 | 4.60 | -48.3 | 116.0 | 0.643 | 10.56 | 112.57 | 23408 | 0.003 | 68408 |
| ONAGAWA | 38.43 | 141.47 | 0.472 | 52.0 | -6 | 1.31 | -21.5 | 139.4 | 0.522 | 9.17 | 141.69 | 2323 | 0.140 | 9830 |
| OOHIRA | 35.62 | 140.50 | 0.459 | 48.7 | -5 | 1.23 | -18.9 | 138.8 | 0.505 | 8.91 | 140.74 | 1849 | 0.167 | 8383 |
| ORCADAS DEL SUR | -60.73 | -44.73 | 0.373 | -53.9 | 4 | 2.08 | 33.9 | -58.3 | 0.506 | -12.13 | -49.81 | 6433 | 0.035 | 22596 |
| OSLO KJELLER | 59.97 | 11.10 | 0.496 | 72.8 | -1 | 3.45 | -53.0 | 44.5 | 0.383 | 2.03 | 22.22 | 15216 | 0.008 | 46861 |
| OTTAWA | 45.40 | -75.75 | 0.584 | 75.2 | -12 | 3.64 | -72.5 | -93.0 | 0.545 | -12.54 | -73.43 | 16642 | 0.006 | 50892 |
| OULU | 65.00 | 25.52 | 0.514 | 76.0 | 7 | 4.37 | -55.0 | 61.0 | 0.451 | 4.01 | 35.97 | 21237 | 0.004 | 63426 |
| PALESTINE | 31.77 | -95.63 | 0.531 | 61.9 | 9 | 1.81 | -50.5 | -114.7 | 0.489 | -10.08 | -101.33 | 5223 | 0.051 | 18560 |
| PANSKA VES | 50.53 | 14.57 | 0.478 | 66.1 | -0 | 2.18 | -38.8 | 33.0 | 0.323 | 3.35 | 20.89 | 6958 | 0.032 | 23414 |
| PARIS-SACLAY | 48.12 | 2.33 | 0.466 | 64.2 | -5 | 2.08 | -38.1 | 23.0 | 0.312 | 2.28 | 10.61 | 6251 | 0.038 | 21462 |
| PARIS-BAGNEUX | 48.80 | 2.32 | 0.468 | 64.8 | -5 | 2.16 | -39.2 | 23.8 | 0.312 | 1.85 | 10.89 | 6606 | 0.035 | 22503 |
| PANAGURITSCH | 42.52 | 24.18 | 0.465 | 58.4 | 2 | 1.56 | -25.9 | 32.4 | 0.335 | 5.74 | 26.62 | 3488 | 0.082 | 13178 |
| PARAMARIBO | 5.82 | -55.22 | 0.343 | 31.1 | -11 | 1.18 | -29.0 | -48.2 | 0.240 | -15.28 | -51.01 | 568 | 0.199 | 4409 |
| PETROPAVLOVSK-ON-K | 52.98 | 158.65 | 0.509 | 64.4 | -4 | 2.02 | -35.7 | 149.0 | 0.598 | 8.60 | 155.34 | 6815 | 0.038 | 22771 |
| PEARCE | -31.67 | 115.97 | 0.589 | -66.4 | -2 | 1.86 | 50.0 | 114.4 | 0.589 | 9.74 | 115.58 | 5970 | 0.048 | 20000 |
| PIC DU MIDI | 42.93 | 0.25 | 0.449 | 59.2 | -6 | 1.69 | -30.7 | 17.0 | 0.315 | 2.88 | 7.45 | 4145 | 0.065 | 15280 |
| PILAR | -31.67 | -63.88 | 0.258 | -28.7 | 4 | 1.15 | 4.0 | -65.0 | 0.348 | -16.77 | -63.74 | 580 | 0.204 | 4434 |
| PIWNICE -TORUN | 50.52 | 14.57 | 0.478 | 66.1 | -0 | 2.18 | -38.7 | 33.0 | 0.323 | 3.34 | 20.88 | 6950 | 0.033 | 23393 |
| PLAISANCE | -20.43 | 57.67 | 0.378 | -54.3 | -15 | 1.32 | 36.4 | 53.8 | 0.493 | 6.56 | 54.01 | 2261 | 0.134 | 9414 |
| POSADAS | -27.42 | -56.10 | 0.243 | -24.2 | -4 | 1.13 | 1.3 | -59.7 | 0.326 | -16.91 | -57.24 | 355 | 0.218 | 3466 |
| PONZA | 40.92 | 12.95 | 0.448 | 56.3 | -1 | 1.51 | -24.6 | 23.3 | 0.330 | 4.93 | 17.03 | 3121 | 0.091 | 12135 |
| PONTA DELGADO | 37.77 | -25.65 | 0.443 | 57.5 | -16 | 1.73 | -37.2 | -1.7 | 0.288 | -2.78 | -14.51 | 4148 | 0.062 | 15591 |
| POTCHEFSTROOM | -26.68 | 27.08 | 0.330 | -63.8 | -18 | 1.58 | 42.7 | 16.7 | 0.457 | 5.03 | 20.44 | 3598 | 0.078 | 13541 |
| POINT BARROW | 71.33 | -156.77 | 0.573 | 80.3 | 29 | 8.08 | -58.9 | 156.1 | 0.664 | 5.12 | 177.00 | 45608 | 0.001 | 129999 |
| POTSDAM | 52.38 | 13.07 | 0.482 | 67.6 | -0 | 2.35 | -41.9 | 34.3 | 0.327 | 2.92 | 20.36 | 8140 | 0.025 | 26831 |
| POITIERS | 46.57 | 0.35 | 0.461 | 62.8 | -6 | 1.95 | -36.3 | 20.3 | 0.311 | 2.22 | 8.59 | 5613 | 0.044 | 19616 |
| PORT ARTHUR | 30.00 | -94.00 | 0.522 | 60.4 | 8 | 1.72 | -49.4 | -111.7 | 0.474 | -10.50 | -99.22 | 4664 | 0.059 | 16974 |
| PCONA | 18.05 | 73.12 | 0.423 | 21.6 | -1 | 0.96 | -0.2 | 74.4 | 0.395 | 7.78 | 73.71 | 200 | 0.353 | 2130 |
| PORO POINT | 16.62 | 120.28 | 0.410 | 19.4 | 0 | 0.95 | -1.0 | 119.8 | 0.412 | 7.98 | 120.15 | 172 | 0.363 | 2031 |
| PORT AUX FRANCAIS | -49.35 | 70.27 | 0.472 | -68.0 | -48 | 3.68 | 63.0 | 45.5 | 0.537 | 6.45 | 50.86 | 17008 | 0.006 | 51349 |
| PORT STANLEY | -51.70 | -57.85 | 0.328 | -47.0 | 8 | 1.58 | 23.2 | -63.0 | 0.464 | -14.15 | -58.23 | 3278 | 0.080 | 13379 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** O R I G I N ** | | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | | ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| PORT MORESBY | -9.20 | 147.15 | 0.431 | -32.6 | 6 | 1.05 | 24.9 | 149.1 | 0.383 | 8.98 | 148.64 | 620 | 0.270 | 4289 |
| PROVIDENIE BAY | 64.38 | 186.60 | 0.547 | 73.8 | 13 | 3.96 | -50.1 | 157.8 | 0.642 | 6.27 | 171.83 | 19162 | 0.005 | 57048 |
| PRAHA | 50.07 | 14.43 | 0.477 | 65.7 | -0 | 2.14 | -38.1 | 32.4 | 0.323 | 3.67 | 20.58 | 6711 | 0.034 | 22696 |
| PRUHONICE | 49.98 | 14.55 | 0.477 | 65.6 | -0 | 2.13 | -37.9 | 32.4 | 0.323 | 3.62 | 20.66 | 6658 | 0.035 | 22542 |
| PRETORIA | -26.80 | 28.20 | 0.330 | -63.9 | -18 | 1.59 | 42.9 | 18.1 | 0.459 | 5.24 | 21.62 | 3637 | 0.078 | 13652 |
| PRINCE ALBERT | 53.20 | -105.70 | 0.609 | 78.4 | 18 | 4.73 | -65.4 | -149.8 | 0.623 | -7.53 | -118.66 | 23943 | 0.003 | 70594 |
| PULLMAN | 46.72 | -117.17 | 0.576 | 71.0 | 20 | 2.81 | -55.1 | -149.9 | 0.588 | -5.11 | -129.79 | 11732 | 0.014 | 36684 |
| PUNTA ARENAS | -53.15 | -70.90 | 0.368 | -49.8 | 18 | 1.62 | 24.2 | -68.9 | 0.481 | -14.47 | -66.39 | 3676 | 0.072 | 14475 |
| PYONGYANG | 39.07 | 125.78 | 0.519 | 55.5 | -6 | 1.33 | -21.9 | 125.4 | 0.533 | 9.14 | 126.59 | 2567 | 0.132 | 10402 |
| QUETTA | 30.18 | 66.95 | 0.482 | 45.6 | 1 | 1.13 | -13.4 | 70.2 | 0.409 | 7.18 | 67.68 | 1254 | 0.210 | 6217 |
| QUEEN MAUD LAND | -70.50 | -1.00 | 0.439 | -62.9 | -18 | 3.99 | 52.6 | -42.9 | 0.523 | -7.80 | -26.14 | 18521 | 0.005 | 56591 |
| QUENTONCITY | 19.00 | 121.00 | 0.418 | 24.3 | -0 | 0.97 | -3.3 | 120.5 | 0.421 | 8.11 | 120.90 | 280 | 0.343 | 2634 |
| QUEBEC | 46.92 | -71.08 | 0.579 | 75.6 | -18 | 3.92 | -75.0 | -80.8 | 0.538 | -12.61 | -65.90 | 18374 | 0.005 | 55825 |
| QUILON | 8.50 | 76.00 | 0.397 | -1.7 | -3 | 0.92 | 9.9 | 75.9 | 0.399 | NO MINIMUM B BETWEEN INTERS. | | | | 155 |
| RABAT | 34.02 | -6.85 | 0.414 | 49.3 | -9 | 1.34 | -20.9 | 6.5 | 0.315 | 3.16 | -0.43 | 2043 | 0.126 | 8968 |
| RAMEY AFB | 18.50 | -67.20 | 0.444 | 51.4 | -6 | 1.43 | -47.3 | -67.3 | 0.323 | -15.01 | -64.84 | 2393 | 0.107 | 10634 |
| RAROTONGA | -21.20 | -159.75 | 0.419 | -37.9 | 13 | 1.13 | 19.4 | -151.6 | 0.363 | 0.23 | -155.25 | 930 | 0.220 | 5479 |
| RESOLUTE | 74.68 | -94.92 | 0.586 | 89.1 | 87 | 101.72 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| REYKJAVIK | 64.18 | -21.70 | 0.512 | 76.0 | -25 | 6.27 | -69.3 | 39.9 | 0.474 | -2.90 | 0.33 | 33140 | 0.001 | 97038 |
| REGENSBERG | 47.48 | 8.45 | 0.467 | 63.4 | -3 | 1.94 | -35.3 | 25.9 | 0.317 | 3.08 | 15.16 | 5632 | 0.044 | 19610 |
| RIO DE JANEIRO | -22.90 | -43.22 | 0.241 | -25.2 | -15 | 1.13 | 4.1 | -50.4 | 0.324 | -13.62 | -45.88 | 337 | 0.219 | 3330 |
| RIO GALLEGOS | -51.63 | -69.22 | 0.354 | -48.3 | 16 | 1.56 | 22.7 | -68.1 | 0.471 | -14.38 | -65.53 | 3283 | 0.081 | 13316 |
| ROYAL ROADS | 48.50 | -123.50 | 0.570 | 70.9 | 23 | 2.86 | -53.9 | -156.9 | 0.594 | -3.44 | -137.30 | 12068 | 0.013 | 37600 |
| ROMA | 41.88 | 12.50 | 0.451 | 57.4 | -1 | 1.56 | -26.0 | 23.7 | 0.328 | 4.86 | 16.85 | 3410 | 0.082 | 13001 |
| ROSTOV/DON | 47.23 | 39.65 | 0.503 | 64.7 | 8 | 1.82 | -32.2 | 49.4 | 0.357 | 6.04 | 41.16 | 5182 | 0.052 | 18088 |
| SANTA CRUZ | -17.80 | -63.17 | 0.257 | -7.9 | -1 | 1.07 | -9.2 | -63.6 | 0.281 | NO MINIMUM B BETWEEN INTERS. | | | | 968 |
| SAN FERNANDO | 36.47 | -6.20 | 0.425 | 52.4 | -9 | 1.43 | -23.9 | 8.5 | 0.315 | 2.96 | 0.67 | 2547 | 0.106 | 10521 |
| SANTA CRUZ | 28.33 | -16.25 | 0.391 | 43.5 | -12 | 1.25 | -18.6 | -2.9 | 0.300 | 1.72 | -9.55 | 1416 | 0.157 | 7039 |
| SANTIAGO | -33.57 | -70.72 | 0.276 | -32.0 | 9 | 1.17 | 6.0 | -69.4 | 0.365 | -16.08 | -69.12 | 753 | 0.195 | 5075 |
| SALEKHARD | 66.58 | 66.67 | 0.568 | 80.1 | 22 | 4.39 | -49.7 | 87.4 | 0.554 | 8.71 | 70.72 | 21788 | 0.004 | 64285 |
| SASKATOON | 52.13 | -106.67 | 0.606 | 77.4 | 19 | 4.35 | -64.1 | -148.8 | 0.618 | -7.19 | -119.48 | 21501 | 0.004 | 63827 |
| SAPPORO | 43.02 | 121.35 | 0.550 | 60.8 | -7 | 1.47 | -25.4 | 121.5 | 0.556 | 9.33 | 122.33 | 3517 | 0.096 | 13116 |
| SACRAMENTO PEAK | 32.72 | -105.75 | 0.523 | 60.6 | 12 | 1.75 | -47.1 | -125.6 | 0.499 | -8.13 | -113.00 | 4876 | 0.057 | 17525 |
| SAN JUAN | 18.43 | -66.00 | 0.441 | 51.2 | -7 | 1.43 | -47.2 | -64.8 | 0.317 | -14.90 | -63.19 | 2366 | 0.107 | 10565 |
| SAN JULIAN | -49.32 | -67.78 | 0.336 | -46.1 | 14 | 1.49 | 20.4 | -67.4 | 0.456 | -14.90 | -64.90 | 2769 | 0.095 | 11788 |
| SAO PAULO | -23.55 | -46.63 | 0.240 | -23.6 | -13 | 1.12 | 2.4 | -52.7 | 0.320 | -14.83 | -48.80 | 297 | 0.222 | 3158 |
| SAO JOSE DOS CAMPO | -23.00 | -46.00 | 0.241 | -23.3 | -13 | 1.12 | 2.4 | -52.1 | 0.319 | -14.53 | -48.18 | 285 | 0.223 | 3085 |
| SALISBURY RHOD-NYA | -17.83 | 31.00 | 0.342 | -55.8 | -9 | 1.31 | 36.4 | 26.8 | 0.446 | 6.61 | 27.93 | 2011 | 0.137 | 8688 |
| SCHWARZENBURG | 46.83 | 7.33 | 0.464 | 62.8 | -3 | 1.90 | -34.6 | 24.6 | 0.316 | 3.20 | 14.07 | 5383 | 0.047 | 18886 |
| SCOTT BASE | -77.85 | 166.75 | 0.655 | -83.3 | -36 | 34.27 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| SENDAI | 38.10 | 140.55 | 0.473 | 51.7 | -6 | 1.30 | -21.2 | 138.6 | 0.521 | 9.03 | 140.83 | 2269 | 0.143 | 9657 |
| SEOUL | 37.58 | 127.05 | 0.508 | 53.5 | -6 | 1.28 | -20.6 | 126.6 | 0.524 | 8.96 | 127.79 | 2272 | 0.146 | 9537 |
| SEATTLE | 47.75 | -122.42 | 0.569 | 70.6 | 22 | 2.80 | -53.7 | -155.2 | 0.591 | -3.87 | -135.86 | 11620 | 0.014 | 36361 |
| SEMIPALATINSK | 50.40 | 80.25 | 0.583 | 70.3 | 6 | 1.95 | -32.8 | 88.0 | 0.524 | 8.71 | 81.28 | 6508 | 0.041 | 21499 |
| SEAGROVE | -37.08 | 174.78 | 0.559 | -63.1 | 18 | 1.84 | 46.1 | -166.0 | 0.464 | 4.41 | -175.28 | 5513 | 0.051 | 19284 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** O R I G I N ** | | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | | ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| SHEPHERD BAY | 68.75 | -93.75 | 0.599 | 88.1 | -18 | 29.31 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| SHIRAZ | 29.63 | 52.52 | 0.459 | 44.5 | 3 | 1.15 | -13.5 | 54.4 | 0.364 | 6.50 | 52.58 | 1198 | 0.204 | 6075 |
| SHACKLETON | -77.98 | -37.17 | 0.512 | -66.4 | 6 | 4.61 | 51.4 | -58.9 | 0.559 | -10.96 | -46.55 | 22675 | 0.003 | 68021 |
| SHEFFIELD | 53.43 | 1.35 | 0.479 | 68.5 | -6 | 2.61 | -46.9 | 29.0 | 0.326 | 1.33 | 11.82 | 9702 | 0.018 | 31412 |
| SIMOSATO | 33.58 | 135.94 | 0.461 | 46.9 | -5 | 1.18 | -17.1 | 134.9 | 0.494 | 8.94 | 136.36 | 1574 | 0.188 | 7486 |
| SIDMOUTH | 50.68 | 3.22 | 0.473 | 66.3 | -5 | 2.29 | -41.9 | 26.4 | 0.316 | 1.95 | 12.18 | 7634 | 0.028 | 25465 |
| SITKA | 57.05 | -135.33 | 0.572 | 74.3 | 29 | 3.91 | -55.6 | -175.2 | 0.625 | -0.35 | -153.53 | 18773 | 0.005 | 56124 |
| SIMFEROPOL | 44.83 | 34.07 | 0.487 | 61.8 | 6 | 1.68 | -29.2 | 42.3 | 0.342 | 5.70 | 35.69 | 4256 | 0.067 | 15419 |
| SINGAPORE | 1.32 | 103.82 | 0.417 | -18.4 | 2 | 0.94 | 17.2 | 104.1 | 0.427 | 8.79 | 104.00 | 147 | 0.378 | 1827 |
| SLOUGH | 51.48 | -0.57 | 0.475 | 67.1 | -7 | 2.42 | -44.5 | 25.4 | 0.317 | 1.04 | 9.64 | 8449 | 0.023 | 27851 |
| SODANKYLA | 67.37 | 26.65 | 0.519 | 77.2 | 8 | 5.09 | -56.9 | 65.7 | 0.477 | 4.44 | 38.43 | 25897 | 0.002 | 76324 |
| SOUTH POLE | -90.00 | 0. | 0.599 | -75.1 | -27 | 13.52 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| SREDNIKAN | 62.43 | 152.32 | 0.558 | 73.3 | -8 | 3.09 | -43.8 | 141.3 | 0.641 | 8.98 | 147.92 | 13723 | 0.011 | 41859 |
| ST. STEPHEN | 67.20 | -45.20 | 0.545 | 79.8 | -44 | 13.13 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| STELLENBOSCH | -33.94 | 18.85 | 0.312 | -65.9 | -26 | 1.82 | 45.0 | 0.3 | 0.457 | 2.41 | 8.10 | 4949 | 0.052 | 17668 |
| STOCKHOLM | 59.30 | 18.10 | 0.499 | 72.5 | 2 | 3.22 | -50.4 | 47.4 | 0.381 | 3.00 | 27.14 | 13785 | 0.010 | 42761 |
| STONYHURST | 53.51 | -2.47 | 0.479 | 68.7 | -8 | 2.68 | -48.4 | 27.1 | 0.327 | 0.60 | 9.00 | 10158 | 0.017 | 32753 |
| ST. LAWRENCE | 50.58 | 1.23 | 0.472 | 66.3 | -6 | 2.31 | -42.4 | 25.2 | 0.314 | 1.39 | 10.68 | 7714 | 0.027 | 25721 |
| STANLEY | -51.70 | -57.85 | 0.328 | -47.0 | 8 | 1.58 | 23.2 | -63.0 | 0.464 | -14.15 | -58.23 | 3278 | 0.080 | 13379 |
| ST. SANTIN-DE-MAUR | 44.60 | 20.20 | 0.467 | 60.6 | 1 | 1.68 | -29.1 | 31.0 | 0.329 | 4.89 | 23.75 | 4185 | 0.066 | 15274 |
| ST. MICHEL | 43.92 | 5.72 | 0.454 | 59.9 | -4 | 1.71 | -30.5 | 21.0 | 0.319 | 3.49 | 11.99 | 4270 | 0.063 | 15615 |
| STANFORD | 37.43 | -122.17 | 0.518 | 61.8 | 17 | 1.84 | -45.1 | -144.5 | 0.530 | -4.48 | -131.62 | 5515 | 0.049 | 19303 |
| ST. JOHNS | 47.52 | -52.78 | 0.536 | 72.0 | -27 | 3.47 | -71.6 | -24.8 | 0.450 | -10.03 | -39.50 | 15244 | 0.007 | 47421 |
| SUKKERTOPPEN | 65.42 | -52.90 | 0.556 | 80.3 | -46 | 13.06 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| SULPHUR MOUNTAIN | 51.10 | -115.60 | 0.592 | 74.7 | 23 | 3.62 | -59.3 | -154.3 | 0.610 | -5.24 | -129.89 | 16904 | 0.006 | 51027 |
| SURLARI | 44.68 | 26.25 | 0.475 | 61.0 | 3 | 1.68 | -28.9 | 35.7 | 0.334 | 5.26 | 28.84 | 4180 | 0.067 | 15232 |
| SVERDLOVSK | 56.73 | 61.07 | 0.559 | 74.1 | 14 | 2.62 | -41.0 | 75.7 | 0.482 | 7.67 | 63.01 | 10480 | 0.017 | 32884 |
| SWANSEA | 51.63 | -4.00 | 0.475 | 67.4 | -9 | 2.48 | -46.1 | 23.8 | 0.317 | 0.47 | 7.10 | 8880 | 0.021 | 29122 |
| SWAKTHMORE | 39.90 | -75.35 | 0.567 | 71.4 | -8 | 2.77 | -67.4 | -88.4 | 0.509 | -12.89 | -73.55 | 11117 | 0.014 | 35488 |
| SYDNEY | -33.60 | 151.10 | 0.584 | -64.3 | 12 | 1.85 | 50.4 | 160.6 | 0.492 | 8.42 | 157.30 | 5672 | 0.050 | 19592 |
| SYKTYVKAR | 61.70 | 50.80 | 0.544 | 76.1 | 17 | 3.39 | -47.3 | 72.4 | 0.477 | 6.63 | 54.95 | 15251 | 0.008 | 46375 |
| SYOWA BASE | -69.03 | 39.60 | 0.471 | -66.3 | -42 | 6.16 | 64.0 | -21.2 | 0.511 | -3.14 | 0.65 | 32380 | 0.001 | 94935 |
| TAMALE | 9.42 | -0.89 | 0.317 | 1.5 | -11 | 1.00 | 8.2 | -0.6 | 0.315 | NO MINIMUM B BETWEEN INTERS. | | | | 143 |
| TASHKENT | 41.42 | 69.20 | 0.540 | 60.8 | 4 | 1.47 | -24.6 | 75.1 | 0.452 | 7.70 | 69.94 | 3370 | 0.096 | 12609 |
| TAMANRASSET | 22.80 | 5.52 | 0.365 | 28.2 | -6 | 1.05 | -3.1 | 9.8 | 0.322 | 7.79 | 7.75 | 402 | 0.263 | 3184 |
| TAIPEI | 25.03 | 121.52 | 0.447 | 35.5 | -1 | 1.03 | -9.0 | 120.9 | 0.450 | 8.40 | 121.58 | 678 | 0.284 | 4341 |
| TALARA | -4.57 | -81.25 | 0.312 | 12.7 | 6 | 1.04 | -17.4 | -83.0 | 0.285 | -13.39 | -82.36 | 70 | 0.279 | 1463 |
| TANANARIVE | -18.92 | 47.55 | 0.354 | -53.7 | -10 | 1.30 | 35.6 | 44.7 | 0.473 | 6.42 | 44.77 | 2030 | 0.142 | 8730 |
| TAHITI | -17.48 | -149.48 | 0.381 | -29.1 | 12 | 1.06 | 12.6 | -143.9 | 0.347 | -1.46 | -146.34 | 482 | 0.264 | 3741 |
| TBILISI | 41.72 | 44.82 | 0.497 | 59.7 | 6 | 1.52 | -25.8 | 50.5 | 0.360 | 6.34 | 45.31 | 3408 | 0.088 | 12674 |
| TENIENTE MATIENZO | -64.97 | -60.05 | 0.431 | -57.5 | 16 | 2.32 | 36.1 | -64.5 | 0.532 | -12.82 | -58.02 | 8122 | 0.024 | 27209 |
| TEHRAN | 35.68 | 51.42 | 0.486 | 53.1 | 5 | 1.30 | -19.6 | 54.8 | 0.369 | 6.44 | 51.56 | 2109 | 0.141 | 8960 |
| TENERIFE | 28.00 | -17.00 | 0.389 | 43.3 | -12 | 1.25 | -18.7 | -3.6 | 0.298 | 1.41 | -10.22 | 1394 | 0.158 | 6977 |
| TEOLOYUCAN | 19.75 | -99.18 | 0.443 | 46.7 | 9 | 1.28 | -35.8 | -110.3 | 0.396 | -9.09 | -103.59 | 1839 | 0.144 | 8580 |
| THULE | 76.55 | -68.83 | 0.568 | 85.4 | -78 | 220.13 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| THE PAS | 53.80 | -101.30 | 0.612 | 79.6 | 14 | 5.24 | -67.9 | -147.1 | 0.625 | -8.34 | -112.87 | 27154 | 0.002 | 79540 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** C | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| TIHANY | 46.89 | 17.89 | 0.472 | 62.8 | 0 | 1.84 | -32.7 | 31.4 | 0.325 | 4.26 | 22.45 | 5100 | 0.051 | 17982 |
| TIXIE BAY | 71.55 | 128.90 | 0.588 | 82.6 | -11 | 5.55 | -50.9 | 124.9 | 0.658 | 10.53 | 125.57 | 29436 | 0.002 | 85087 |
| TIRUCHIRAPALLI | 10.83 | 78.83 | 0.403 | 3.3 | -2 | 0.92 | 8.1 | 79.0 | 0.400 | 8.54 | 78.98 | 2 | 0.400 | 302 |
| TORINO | 45.20 | 7.65 | 0.459 | 61.2 | -3 | 1.78 | -32.0 | 23.3 | 0.319 | 3.63 | 13.83 | 4687 | 0.056 | 16832 |
| TOTTORI | 35.53 | 134.22 | 0.477 | 49.7 | -6 | 1.23 | -18.9 | 133.2 | 0.508 | 8.97 | 134.76 | 1875 | 0.168 | 8405 |
| TORUN | 53.08 | 18.55 | 0.487 | 68.2 | 2 | 2.38 | -41.8 | 38.8 | 0.336 | 3.52 | 24.88 | 8376 | 0.024 | 27456 |
| TOMSK | 56.47 | 84.93 | 0.597 | 75.5 | 7 | 2.51 | -38.5 | 94.0 | 0.562 | 9.30 | 86.30 | 10034 | 0.019 | 31366 |
| TORRE CHIARUCCIA | 42.03 | 11.83 | 0.451 | 57.6 | -1 | 1.57 | -26.4 | 23.3 | 0.328 | 4.57 | 16.38 | 3467 | 0.081 | 13181 |
| TORTOSA | 40.82 | 0.50 | 0.442 | 56.9 | -6 | 1.57 | -27.5 | 15.5 | 0.319 | 3.33 | 7.09 | 3438 | 0.080 | 13170 |
| TOLEDO | 39.88 | -4.05 | 0.438 | 56.2 | -8 | 1.56 | -27.8 | 12.1 | 0.315 | 2.75 | 3.25 | 3352 | 0.082 | 12949 |
| TOYOKAWA | 35.83 | 137.37 | 0.469 | 49.5 | -6 | 1.24 | -19.1 | 136.0 | 0.508 | 8.99 | 137.80 | 1902 | 0.165 | 8516 |
| TONANZINTLA | 19.03 | -98.30 | 0.440 | 45.9 | 9 | 1.27 | -35.3 | -109.1 | 0.390 | -9.39 | -102.59 | 1745 | 0.149 | 8285 |
| TOWNSVILLE | -19.10 | 146.50 | 0.498 | -48.0 | 7 | 1.24 | 35.5 | 149.8 | 0.432 | 8.92 | 149.23 | 1803 | 0.167 | 8316 |
| TRUJILLO | -8.10 | -79.03 | 0.298 | 6.8 | 6 | 1.03 | -15.0 | -79.9 | 0.283 | -14.25 | -79.77 | 9 | 0.283 | 776 |
| TROMSO | 69.67 | 18.95 | 0.517 | 77.9 | 2 | 6.29 | -60.5 | 66.7 | 0.496 | 3.47 | 34.84 | 33505 | 0.001 | 97492 |
| TRELEW | -43.20 | -65.30 | 0.297 | -40.6 | 10 | 1.33 | 14.6 | -66.2 | 0.417 | -15.43 | -63.95 | 1739 | 0.133 | 8576 |
| TRIVANDRUM | 8.42 | 76.95 | 0.398 | -2.1 | -3 | 0.92 | 10.2 | 76.8 | 0.400 | NO MINIMUM B BETWEEN INTERS. | | | | 194 |
| TRINIDAD | 10.60 | -61.20 | 0.383 | 40.4 | -8 | 1.26 | -37.8 | -56.3 | 0.260 | -15.68 | -57.82 | 1147 | 0.162 | 6617 |
| TSCHOIBALSAN | 48.07 | 114.50 | 0.583 | 66.9 | -6 | 1.73 | -29.9 | 115.9 | 0.580 | 9.75 | 115.64 | 5181 | 0.059 | 17783 |
| TSUMEB | -19.23 | 17.72 | 0.332 | -57.2 | -16 | 1.34 | 36.5 | 8.5 | 0.428 | 5.62 | 12.50 | 2138 | 0.126 | 9146 |
| TUBINGEN | 48.53 | 9.07 | 0.470 | 64.3 | -2 | 2.04 | -36.8 | 27.4 | 0.317 | 2.93 | 15.97 | 6113 | 0.039 | 21008 |
| TUCSON | 32.23 | -110.95 | 0.510 | 58.9 | 13 | 1.67 | -44.5 | -130.0 | 0.496 | -6.76 | -118.38 | 4369 | 0.066 | 16061 |
| TUCSON | 32.23 | -110.95 | 0.510 | 58.9 | 13 | 1.67 | -44.5 | -130.0 | 0.496 | -6.76 | -118.38 | 4369 | 0.066 | 16061 |
| TUCUMAN | -26.90 | -65.40 | 0.255 | -22.5 | 3 | 1.11 | -0.5 | -65.9 | 0.323 | -17.06 | -65.23 | 299 | 0.230 | 3122 |
| UJI | 34.90 | 135.78 | 0.469 | 48.6 | -6 | 1.21 | -18.3 | 134.7 | 0.503 | 8.94 | 136.25 | 1767 | 0.174 | 8087 |
| ULAN BATOR | 47.78 | 106.75 | 0.589 | 67.3 | -3 | 1.72 | -29.5 | 109.2 | 0.571 | 9.68 | 107.82 | 5146 | 0.059 | 17636 |
| UNALASKA | 53.58 | -166.53 | 0.505 | 66.1 | 15 | 2.42 | -43.1 | 169.7 | 0.598 | 4.97 | -178.15 | 9264 | 0.022 | 29762 |
| UNIVERSITY PARK | 40.80 | -77.77 | 0.574 | 72.2 | -7 | 2.88 | -67.5 | -94.3 | 0.523 | -12.75 | -77.09 | 11840 | 0.013 | 37456 |
| UPPSALA | 59.80 | 17.60 | 0.499 | 72.8 | 2 | 3.32 | -51.1 | 47.9 | 0.386 | 3.10 | 26.98 | 14395 | 0.009 | 44474 |
| USHUAIA | -54.80 | -68.30 | 0.373 | -50.6 | 17 | 1.69 | 25.7 | -67.7 | 0.488 | -14.26 | -64.44 | 4075 | 0.064 | 15668 |
| UTSJOKI | 69.75 | 27.03 | 0.523 | 78.3 | 8 | 6.04 | -58.8 | 70.2 | 0.503 | 4.78 | 40.63 | 32002 | 0.001 | 93208 |
| VALENTIA | 51.94 | -10.25 | 0.478 | 68.0 | -12 | 2.64 | -49.5 | 21.0 | 0.322 | -0.82 | 2.48 | 9848 | 0.018 | 31959 |
| VERKHOYANSK | 67.60 | 133.40 | 0.587 | 79.7 | -13 | 4.22 | -47.5 | 128.4 | 0.654 | 10.38 | 130.86 | 20955 | 0.004 | 61677 |
| VAL D'OR | 48.00 | -77.80 | 0.593 | 77.0 | -12 | 4.22 | -74.1 | -100.9 | 0.566 | -12.46 | -76.34 | 20382 | 0.004 | 61242 |
| VICTORIA | 48.40 | -123.40 | 0.570 | 70.9 | 23 | 2.85 | -53.8 | -156.7 | 0.593 | -3.49 | -137.15 | 11998 | 0.013 | 37408 |
| VLADIVOSTOK | 43.78 | 132.03 | 0.528 | 59.8 | -9 | 1.50 | -26.2 | 130.9 | 0.560 | 9.26 | 132.85 | 3610 | 0.092 | 13489 |
| VOSTOK | -76.48 | 106.50 | 0.627 | -79.5 | 72 | 103.75 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| WATHEROO | -30.32 | 115.88 | 0.582 | -65.1 | -2 | 1.76 | 48.6 | 114.5 | 0.584 | 9.80 | 115.62 | 5368 | 0.056 | 18311 |
| WAKKANAI | 45.40 | 141.68 | 0.510 | 59.6 | -9 | 1.56 | -27.8 | 138.7 | 0.565 | 9.22 | 141.80 | 3956 | 0.082 | 14577 |
| WASHINGTON | 38.73 | -77.13 | 0.565 | 70.6 | -6 | 2.62 | -65.7 | -91.8 | 0.507 | -12.83 | -76.37 | 10217 | 0.017 | 32926 |
| WALTAIR | 17.57 | 83.30 | 0.427 | 18.6 | -1 | 0.94 | 2.0 | 84.1 | 0.408 | 8.87 | 83.67 | 146 | 0.375 | 1796 |
| WELLEN | 66.17 | -169.84 | 0.555 | 75.4 | 16 | 4.59 | -52.3 | 157.7 | 0.649 | 6.06 | 173.13 | 23209 | 0.003 | 68215 |
| WESTFORD | 42.58 | -71.42 | 0.569 | 72.9 | -14 | 3.13 | -70.9 | -79.7 | 0.512 | -12.87 | -67.19 | 13348 | 0.010 | 41819 |
| WEISSENAU | 47.80 | 9.50 | 0.468 | 63.7 | -2 | 1.97 | -35.6 | 26.9 | 0.318 | 3.32 | 16.04 | 5742 | 0.043 | 19918 |
| WELLINGTON | -41.28 | 174.77 | 0.580 | -66.7 | 20 | 2.15 | 50.1 | -162.4 | 0.491 | 4.18 | -173.52 | 7520 | 0.032 | 24919 |

## Table 2

### Tracings from Surface to Surface

| STATIONS | ** C | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| WHITE SANDS | 32.40 | -106.87 | 0.519 | 60.0 | 12 | 1.72 | -46.3 | -126.4 | 0.497 | -7.81 | -114.12 | 4684 | 0.060 | 16973 |
| WINGST | 53.75 | 9.07 | 0.482 | 68.6 | -2 | 2.54 | -45.0 | 33.7 | 0.330 | 2.33 | 17.80 | 9327 | 0.020 | 30263 |
| WITTEVEEN | 52.82 | 6.67 | 0.479 | 68.0 | -4 | 2.46 | -44.2 | 31.1 | 0.324 | 2.05 | 15.62 | 8812 | 0.022 | 28817 |
| WIESE ISLAND | 79.83 | 76.98 | 0.564 | 85.2 | 32 | 12.00 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| WINNIPEG | 49.90 | -97.40 | 0.608 | 77.5 | 10 | 4.22 | -66.8 | -136.3 | 0.606 | -9.62 | -106.33 | 20587 | 0.004 | 61410 |
| WIEN KOBENZL | 48.27 | 16.32 | 0.474 | 64.1 | 0 | 1.97 | -35.0 | 31.7 | 0.323 | 4.15 | 21.53 | 5748 | 0.043 | 19832 |
| WILKES | -66.20 | 110.35 | 0.640 | -81.8 | -83 | 35.17 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| WOOMERA | -30.70 | 136.80 | 0.584 | -63.2 | 6 | 1.73 | 48.6 | 139.8 | 0.531 | 9.28 | 139.99 | 5026 | 0.061 | 17587 |
| WROCLAW | 51.10 | 17.08 | 0.482 | 66.6 | 1 | 2.20 | -39.2 | 35.3 | 0.327 | 3.73 | 23.02 | 7199 | 0.031 | 24086 |
| WRANGEL ISLAND | 71.00 | -178.50 | 0.566 | 78.8 | 12 | 6.15 | -54.6 | 149.1 | 0.662 | 7.21 | 163.20 | 33192 | 0.001 | 95667 |
| YAKUTSK | 62.05 | 129.67 | 0.589 | 76.4 | -13 | 3.07 | -42.5 | 127.3 | 0.641 | 10.32 | 129.23 | 13667 | 0.011 | 41512 |
| YAMAGAWA | 31.20 | 130.65 | 0.461 | 44.4 | -4 | 1.13 | -15.0 | 130.0 | 0.483 | 8.65 | 131.07 | 1291 | 0.213 | 6533 |
| YELLOWKNIFE | 62.40 | -114.40 | 0.606 | 82.3 | 33 | 8.38 | -67.2 | -173.4 | 0.652 | -4.59 | -135.26 | 47291 | 0.001 | 135001 |
| YUZHNO-SAKHALINSK | 46.95 | 142.72 | 0.515 | 61.0 | -9 | 1.63 | -29.3 | 139.3 | 0.573 | 9.30 | 142.67 | 4421 | 0.071 | 15910 |
| ZARIA | 11.15 | 7.65 | 0.328 | 1.9 | -8 | 0.99 | 9.6 | 7.9 | 0.326 | NO MINIMUM B BETWEEN INTERS. | | | | 178 |
| ZUGSPITZE | 47.42 | 10.98 | 0.467 | 63.3 | -1 | 1.92 | -34.7 | 27.4 | 0.319 | 3.36 | 17.12 | 5516 | 0.046 | 19245 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** | O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** | MINIMUM-B | E Q U A T O R | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| ABASHIRI | | 43.97 | 140.33 | 0.437 | 58.3 | -7 | 1.57 | -26.3 | 157.5 | 0.479 | 9.31 | 140.28 | 4909 | 0.081 | 14011 |
| ABISKO | | 68.35 | 18.82 | 0.457 | 77.2 | 0 | 5.95 | -59.4 | 63.5 | 0.425 | 3.59 | 34.06 | 31311 | 0.001 | 90799 |
| ABERYSTWYTH | | 52.40 | -4.07 | 0.420 | 67.7 | -9 | 2.70 | -48.0 | 25.0 | 0.295 | 0.14 | 7.55 | 10317 | 0.016 | 32573 |
| ACCRA | | 5.63 | -0.20 | 0.267 | -6.0 | -11 | 1.06 | 10.8 | -1.3 | 0.275 | 6.35 | -0.36 | 308 | 0.267 | 611 |
| ADEN | | 12.77 | 44.97 | 0.315 | 9.8 | 1 | 1.02 | 4.4 | 45.0 | 0.300 | 6.76 | 44.96 | 334 | 0.298 | 978 |
| ADDIS ABABA | | 9.03 | 38.77 | 0.302 | -0.8 | 0 | 1.01 | 9.7 | 38.8 | 0.303 | NO MINIMUM B BETWEEN INTERS. | | | | 76 |
| ADELAIDE | | -34.95 | 138.53 | 0.522 | -67.1 | 7 | 2.13 | 53.3 | 143.8 | 0.469 | 9.32 | 142.64 | 7562 | 0.032 | 24064 |
| ADAK | | 51.90 | -176.65 | 0.427 | 63.9 | 10 | 2.21 | -39.0 | 164.7 | 0.509 | 6.13 | 174.52 | 7946 | 0.029 | 25409 |
| AGINCOURT | | 43.80 | -79.30 | 0.503 | 74.0 | -6 | 3.46 | -69.6 | -98.8 | 0.469 | -12.28 | -79.25 | 15553 | 0.007 | 47139 |
| AHMEDABAD | | 23.02 | 72.60 | 0.381 | 31.9 | -0 | 1.06 | -5.5 | 74.6 | 0.347 | 7.80 | 73.32 | 821 | 0.260 | 3702 |
| AIRE-SUR-ADOUR | | 43.70 | -0.30 | 0.395 | 59.8 | -7 | 1.84 | -33.3 | 17.8 | 0.278 | 2.27 | 7.46 | 5045 | 0.051 | 17284 |
| AKROTIRI | | 34.58 | 32.95 | 0.385 | 48.7 | 3 | 1.32 | -16.9 | 36.3 | 0.299 | 6.56 | 33.69 | 2121 | 0.134 | 8258 |
| AKLAVIK | | 68.23 | -135.00 | 0.512 | 81.2 | 37 | 9.46 | -62.9 | 167.9 | 0.572 | 0.98 | -162.58 | 54361 | 0.000 | 153685 |
| AKITA | | 39.73 | 140.13 | 0.418 | 53.7 | -5 | 1.41 | -22.5 | 137.9 | 0.456 | 9.25 | 140.17 | 2985 | 0.112 | 11027 |
| ALMERIA | | 36.85 | -2.47 | 0.371 | 52.3 | -8 | 1.50 | -24.3 | 11.4 | 0.278 | 3.09 | 3.95 | 2988 | 0.092 | 11119 |
| ALDAN | | 58.60 | 125.50 | 0.509 | 74.0 | -10 | 2.70 | -39.2 | 124.5 | 0.541 | 10.08 | 125.63 | 11286 | 0.016 | 34261 |
| ALERT | | 82.55 | -63.58 | 0.495 | 86.3 | -65 | 248.58 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| ALMA-ATA | | 43.20 | 76.92 | 0.477 | 62.2 | 3 | 1.60 | -25.7 | 82.7 | 0.420 | 8.37 | 77.87 | 4219 | 0.075 | 14339 |
| ALBUQUERQUE | | 35.08 | -106.62 | 0.462 | 62.9 | 12 | 1.98 | -49.3 | -128.3 | 0.447 | -7.83 | -114.38 | 6377 | 0.039 | 21100 |
| ALMIRANTE BROWN | | -64.88 | -62.87 | 0.382 | -59.0 | 16 | 2.45 | 35.4 | -65.6 | 0.462 | -12.84 | -59.98 | 9009 | 0.021 | 29107 |
| ANCON | | -11.77 | -77.15 | 0.250 | 1.0 | 5 | 1.08 | -12.8 | -77.2 | 0.248 | NO MINIMUM B BETWEEN INTERS. | | | | 116 |
| ANCHORAGE | | 61.17 | -149.98 | 0.487 | 74.3 | 25 | 4.33 | -53.7 | 172.2 | 0.550 | 2.78 | -168.66 | 21492 | 0.004 | 62960 |
| ANTOFAGASTA | | -23.65 | -70.42 | 0.233 | -18.4 | 5 | 1.13 | -3.2 | -69.8 | 0.271 | -16.28 | -69.96 | 488 | 0.218 | 2473 |
| APIA | | -13.80 | -171.77 | 0.344 | -29.2 | 12 | 1.10 | 16.0 | -166.0 | 0.300 | 2.58 | -168.51 | 802 | 0.235 | 3892 |
| APATITY | | 67.55 | 33.33 | 0.465 | 77.4 | 9 | 5.22 | -55.6 | 69.0 | 0.430 | 5.29 | 44.21 | 26758 | 0.002 | 77965 |
| ARKHANGELSK | | 64.58 | 40.50 | 0.467 | 76.4 | 11 | 4.22 | -51.5 | 68.8 | 0.418 | 5.89 | 48.05 | 20412 | 0.004 | 60255 |
| ARCETRI | | 43.75 | 11.25 | 0.398 | 59.3 | -2 | 1.76 | -30.2 | 24.9 | 0.286 | 3.85 | 16.63 | 4596 | 0.058 | 15867 |
| AREQUIPA | | -16.35 | -71.57 | 0.237 | -6.0 | 3 | 1.10 | -10.0 | -71.3 | 0.249 | -16.14 | -71.56 | 303 | 0.237 | 740 |
| ARGENTINE ISLAND | | -65.25 | -64.27 | 0.386 | -59.4 | 17 | 2.50 | 36.8 | -66.2 | 0.464 | -13.06 | -60.70 | 9252 | 0.020 | 29785 |
| ARMIDALE | | -30.30 | 151.40 | 0.487 | -60.8 | 11 | 1.73 | 45.8 | 159.8 | 0.415 | 8.24 | 156.79 | 4906 | 0.061 | 16740 |
| ASSWAN | | 23.97 | 32.78 | 0.341 | 30.9 | 1 | 1.10 | -4.6 | 33.5 | 0.293 | 7.64 | 32.93 | 806 | 0.231 | 3690 |
| ASO | | 32.88 | 131.02 | 0.404 | 46.4 | -4 | 1.22 | -16.1 | 130.2 | 0.423 | 8.92 | 131.35 | 1849 | 0.170 | 7481 |
| ASHKABAD | | 37.93 | 55.10 | 0.330 | 55.6 | 4 | 1.43 | -22.1 | 59.9 | 0.339 | 6.64 | 55.66 | 2955 | 0.106 | 10769 |
| ATHENS | | 37.97 | 23.72 | 0.387 | 52.5 | 1 | 1.44 | -20.8 | 30.0 | 0.295 | 6.06 | 25.81 | 2765 | 0.104 | 10285 |
| BAJA | | 46.18 | 19.00 | 0.410 | 61.8 | 0 | 1.88 | -32.4 | 32.2 | 0.292 | 4.31 | 23.52 | 5360 | 0.048 | 18069 |
| BAGHDAD | | 33.35 | 44.38 | 0.396 | 48.6 | 4 | 1.29 | -16.8 | 47.0 | 0.308 | 6.53 | 44.60 | 2020 | 0.143 | 7925 |
| BANGKOK | | 13.75 | 100.55 | 0.357 | 10.0 | 0 | 0.97 | 5.2 | 100.5 | 0.352 | 9.05 | 100.52 | 343 | 0.343 | 1001 |
| BAR I | | 69.58 | -140.18 | 0.509 | 81.2 | 36 | 9.63 | -62.1 | 163.9 | 0.574 | 2.26 | -168.63 | 55536 | 0.000 | 156878 |
| BALBOA | | 8.95 | -79.57 | 0.334 | 37.4 | 3 | 1.22 | -33.2 | -84.9 | 0.276 | -13.61 | -81.26 | 1274 | 0.168 | 5872 |
| BAIE ST. PAUL | | 47.43 | -70.50 | 0.500 | 75.5 | -17 | 4.18 | -75.2 | -78.3 | 0.463 | -12.21 | -65.29 | 20030 | 0.004 | 59801 |
| BARTER ISLAND | | 70.13 | -143.67 | 0.507 | 81.0 | 35 | 9.47 | -61.5 | 162.0 | 0.574 | 2.93 | -172.10 | 54500 | 0.000 | 153994 |
| BAKER LAKE | | 64.30 | -96.08 | 0.528 | 85.6 | 6 | 15.35 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| BATTLE CREEK | | 42.27 | -85.17 | 0.503 | 72.7 | -0 | 3.13 | -65.8 | -108.7 | 0.473 | -11.77 | -88.01 | 13563 | 0.010 | 41469 |
| BANARAS | | 25.33 | 83.02 | 0.398 | 35.1 | -0 | 1.07 | -6.5 | 84.7 | 0.368 | 8.70 | 83.62 | 962 | 0.251 | 4243 |
| BANGUI | | 4.60 | 18.58 | 0.283 | -14.4 | -5 | 1.04 | 16.6 | 17.5 | 0.301 | 8.86 | 18.15 | 381 | 0.274 | 1434 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** | O R I G I N | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | | ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| BASE ROI BAUDOUIN | | -70.43 | 23.32 | 0.404 | -66.3 | -33 | 5.57 | 59.8 | -31.5 | 0.455 | -5.53 | -11.43 | 28636 | 0.002 | 84016 |
| BANGUIO | | 16.42 | 120.58 | 0.352 | 18.5 | 0 | 1.00 | -0.4 | 120.2 | 0.353 | 8.19 | 120.47 | 463 | 0.315 | 2021 |
| BELEM | | -1.00 | -49.00 | 0.259 | 16.3 | -13 | 1.14 | -17.9 | -44.7 | 0.217 | -13.50 | -45.86 | 416 | 0.213 | 2092 |
| BELSK | | 51.84 | 20.80 | 0.427 | 66.9 | 1 | 2.34 | -40.2 | 39.3 | 0.304 | 4.06 | 26.61 | 8203 | 0.025 | 26280 |
| BETTLES | | 66.90 | -151.84 | 0.498 | 77.9 | 28 | 6.28 | -57.3 | 164.2 | 0.566 | 3.66 | -174.64 | 34007 | 0.001 | 97449 |
| BEDFORD | | 42.48 | -71.28 | 0.490 | 72.5 | -13 | 3.24 | -70.5 | -78.5 | 0.440 | -12.82 | -67.28 | 14034 | 0.009 | 43083 |
| BERMUDA | | 32.37 | -64.67 | 0.445 | 64.1 | -12 | 2.13 | -60.8 | -60.8 | 0.352 | -13.34 | -59.30 | 6861 | 0.032 | 23035 |
| BEOGRAD | | 44.80 | 20.52 | 0.408 | 60.4 | 0 | 1.78 | -30.3 | 32.1 | 0.293 | 4.60 | 24.44 | 4794 | 0.056 | 16396 |
| BIRD | | 56.50 | 94.20 | 0.519 | 74.8 | 2 | 2.56 | -37.9 | 101.0 | 0.504 | 9.90 | 95.59 | 10404 | 0.018 | 31724 |
| BISMARK | | 46.82 | -100.77 | 0.515 | 74.3 | 12 | 3.53 | -62.7 | -134.8 | 0.510 | -8.91 | -110.07 | 16235 | 0.007 | 48673 |
| BJORNOYA | | 74.52 | 19.02 | 0.469 | 80.2 | -0 | 9.97 | -63.5 | 76.8 | 0.476 | 4.54 | 41.23 | 57148 | 0.000 | 162139 |
| BOROK | | 58.03 | 38.33 | 0.457 | 72.4 | 9 | 2.97 | -45.2 | 59.3 | 0.368 | 5.35 | 43.36 | 12445 | 0.012 | 38035 |
| BOLOGNA | | 44.50 | 11.35 | 0.401 | 60.1 | -2 | 1.80 | -31.2 | 25.6 | 0.286 | 3.78 | 16.90 | 4874 | 0.054 | 16637 |
| BOULDER | | 40.03 | -105.30 | 0.487 | 67.8 | 13 | 2.43 | -54.6 | -101.7 | 0.476 | -8.28 | -114.09 | 9236 | 0.021 | 29144 |
| BOMBAY | | 19.00 | 72.83 | 0.364 | 23.6 | -1 | 1.02 | -1.4 | 74.2 | 0.339 | 7.83 | 73.43 | 559 | 0.295 | 2515 |
| BOGOTA | | 4.63 | -74.08 | 0.310 | 31.9 | 1 | 1.19 | -30.8 | -76.9 | 0.252 | -15.09 | -74.83 | 943 | 0.186 | 4653 |
| BRISBANE | | -27.53 | 152.92 | 0.470 | -57.6 | 10 | 1.58 | 43.7 | 160.7 | 0.398 | 8.17 | 157.91 | 3463 | 0.080 | 14048 |
| BUDAPEST | | 46.68 | 21.27 | 0.414 | 62.3 | 1 | 1.90 | -32.9 | 34.3 | 0.294 | 4.64 | 25.49 | 5533 | 0.046 | 18556 |
| BUENOS AIRES | | -34.52 | -58.50 | 0.230 | -32.8 | 0 | 1.25 | 7.4 | -62.0 | 0.314 | -15.83 | -59.48 | 1177 | 0.160 | 5706 |
| BUNIA | | 1.53 | 30.18 | 0.290 | -20.6 | -2 | 1.05 | 18.9 | 29.7 | 0.319 | 8.37 | 29.91 | 478 | 0.269 | 2102 |
| BYRD STATION | | -79.98 | -120.02 | 0.521 | -75.1 | 68 | 7.68 | 56.0 | -79.2 | 0.521 | -12.07 | -78.24 | 42515 | 0.001 | 121915 |
| CAPRI | | 40.57 | 14.33 | 0.389 | 55.6 | -1 | 1.57 | -25.1 | 24.6 | 0.289 | 4.77 | 18.39 | 3503 | 0.080 | 12580 |
| CASTEL TESINO | | 46.05 | 11.65 | 0.405 | 61.6 | -2 | 1.91 | -33.5 | 27.2 | 0.286 | 3.64 | 17.54 | 5494 | 0.046 | 18508 |
| CATANIA | | 37.50 | 15.07 | 0.379 | 51.8 | -1 | 1.43 | -20.7 | 23.3 | 0.291 | 5.71 | 18.36 | 2712 | 0.104 | 10152 |
| CAPE CHELYUSKIN | | 77.72 | 104.28 | 0.507 | 85.5 | 12 | 9.52 | -56.3 | 112.9 | 0.558 | 10.99 | 104.54 | 54689 | 0.000 | 154303 |
| CAPE ZHELANIA | | 76.90 | 68.60 | 0.495 | 83.7 | 22 | 9.53 | -57.9 | 98.0 | 0.526 | 9.45 | 78.31 | 54643 | 0.000 | 154490 |
| CAPE SCHMIDT | | 68.87 | -179.48 | 0.491 | 77.2 | 11 | 5.40 | -52.8 | 150.7 | 0.569 | 7.17 | 164.20 | 28427 | 0.002 | 81924 |
| CAMBRIDGE UK | | 52.22 | 0.10 | 0.419 | 67.4 | -7 | 2.61 | -46.1 | 27.0 | 0.294 | 0.87 | 10.67 | 9728 | 0.018 | 30850 |
| CARIBOU | | 46.87 | -68.02 | 0.495 | 74.8 | -19 | 4.01 | -74.9 | -70.2 | 0.452 | -12.37 | -61.60 | 18888 | 0.005 | 56682 |
| CALCUTTA | | 22.93 | 88.52 | 0.388 | 30.0 | -0 | 1.03 | -3.6 | 89.5 | 0.366 | 9.01 | 88.89 | 751 | 0.279 | 3400 |
| CAPE HALLETT | | -72.32 | 178.22 | 0.569 | -83.6 | -88 | 16.57 | ** N O | C O M P U T A T I O N S | | | P E R F O R M E D ** | | | |
| CAMPBELL ISLAND | | -52.55 | 169.15 | 0.550 | -76.1 | 27 | 4.20 | 61.7 | -155.2 | 0.483 | 3.62 | -173.12 | 20618 | 0.004 | 60528 |
| CANBERRA | | -35.32 | 149.00 | 0.514 | -66.1 | 11 | 2.08 | 52.5 | 158.8 | 0.442 | 8.57 | 155.22 | 7197 | 0.035 | 23177 |
| CAPETOWN | | -34.15 | 18.32 | 0.278 | -64.2 | -25 | 1.88 | 44.3 | -0.3 | 0.397 | 1.94 | 7.70 | 5265 | 0.048 | 17339 |
| CAMDEN | | -34.08 | 150.68 | 0.506 | -64.7 | 11 | 1.98 | 50.9 | 160.6 | 0.433 | 8.39 | 156.88 | 6483 | 0.041 | 21194 |
| CAPE CANAVERAL | | 28.40 | -80.60 | 0.444 | 61.2 | 0 | 1.85 | -53.9 | -92.7 | 0.383 | -12.93 | -82.14 | 5329 | 0.048 | 18344 |
| CAPE JONES | | 54.50 | -79.50 | 0.520 | 80.5 | -15 | 6.80 | -78.7 | -116.0 | 0.516 | -11.97 | -78.82 | 36816 | 0.001 | 106130 |
| CEBU | | 10.33 | 123.90 | 0.338 | 5.6 | 1 | 0.98 | 5.3 | 123.8 | 0.339 | 8.08 | 123.85 | 314 | 0.335 | 591 |
| CHAMICAL | | -30.33 | -66.33 | 0.233 | -27.7 | 4 | 1.19 | 2.8 | -66.7 | 0.296 | -16.19 | -65.92 | 831 | 0.187 | 4255 |
| CHURCHILL | | 58.77 | -94.17 | 0.530 | 83.0 | 4 | 8.89 | -74.5 | -151.6 | 0.548 | -9.91 | -103.82 | 50305 | 0.000 | 143085 |
| CHAMBON-LA-FORET | | 48.02 | 2.27 | 0.408 | 63.8 | -6 | 2.15 | -39.0 | 23.4 | 0.282 | 1.84 | 10.82 | 6683 | 0.032 | 22644 |
| CHICAGO | | 41.83 | -87.67 | 0.503 | 72.2 | 2 | 3.03 | -64.3 | -112.3 | 0.475 | -11.60 | -91.59 | 12900 | 0.011 | 39574 |
| CHARLOTTESVILLE | | 38.03 | -78.22 | 0.485 | 69.7 | -4 | 2.65 | -64.5 | -92.7 | 0.435 | -12.73 | -78.13 | 10366 | 0.016 | 32665 |
| CHITA | | 52.05 | 113.48 | 0.509 | 70.1 | -6 | 2.08 | -33.3 | 115.3 | 0.513 | 9.88 | 114.52 | 7382 | 0.034 | 23307 |
| CHITTAGONG | | 22.35 | 91.82 | 0.386 | 28.7 | -0 | 1.03 | -3.0 | 92.5 | 0.366 | 9.07 | 92.08 | 708 | 0.286 | 3215 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** GEOGRAPHIC | | | | | | ** CONJUGATE | | INTERS. | ** MINIMUM-B EQUATOR | | | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| CHRISTCHURCH | -43.57 | 172.80 | 0.515 | -68.9 | 20 | 2.52 | 52.9 | -162.5 | 0.443 | 4.33 | -174.60 | 9893 | 0.020 | 30870 |
| CHACALTAYA | -16.32 | -68.15 | 0.234 | -5.3 | 1 | 1.10 | -10.6 | -68.1 | 0.245 | NO MINIMUM B BETWEEN INTERS. | | | | 666 |
| CLIMAX | 39.37 | -106.18 | 0.483 | 67.1 | 13 | 2.35 | -53.6 | -131.9 | 0.473 | -8.04 | -114.94 | 8704 | 0.024 | 27649 |
| CLONCURRY | -20.67 | 140.50 | 0.444 | -50.9 | 6 | 1.35 | 37.7 | 143.0 | 0.402 | 9.17 | 142.86 | 2567 | 0.128 | 9805 |
| CONCORD | 43.20 | -71.53 | 0.492 | 73.0 | -13 | 3.36 | -71.1 | -79.4 | 0.444 | -12.54 | -67.55 | 14781 | 0.008 | 45162 |
| COOK | -30.63 | 130.40 | 0.505 | -63.7 | 3 | 1.83 | 48.9 | 132.1 | 0.474 | 9.61 | 132.53 | 5713 | 0.051 | 18774 |
| COLLEGE | 64.85 | -147.83 | 0.498 | 77.1 | 28 | 5.71 | -57.0 | 188.6 | 0.562 | 2.90 | -169.67 | 30334 | 0.002 | 87350 |
| CORINALDO | 43.63 | 13.00 | 0.399 | 59.1 | -2 | 1.74 | -29.7 | 26.0 | 0.287 | 4.26 | 17.98 | 4509 | 0.060 | 15592 |
| COIMBRA | 40.22 | -8.42 | 0.384 | 57.0 | -10 | 1.72 | -31.6 | 10.3 | 0.272 | 1.01 | 0.13 | 4245 | 0.062 | 14988 |
| CONCEPCION | -36.58 | -72.98 | 0.259 | -36.4 | 11 | 1.27 | 9.2 | -70.9 | 0.333 | -15.38 | -73.72 | 1404 | 0.153 | 6449 |
| CORDOBA | -31.32 | -64.22 | 0.231 | -28.8 | 3 | 1.20 | 3.7 | -65.3 | 0.299 | -16.31 | -64.11 | 896 | 0.181 | 4557 |
| COLOMBO | 6.90 | 79.87 | 0.341 | -6.0 | -3 | 0.97 | 11.9 | 79.6 | 0.347 | 8.49 | 79.77 | 313 | 0.340 | 580 |
| COCOS ISLAND | -12.20 | 96.90 | 0.403 | -44.8 | -2 | 1.16 | 31.0 | 95.8 | 0.430 | 9.09 | 96.20 | 1572 | 0.196 | 6377 |
| COPENHAGEN | 55.75 | 12.50 | 0.430 | 69.7 | -1 | 2.88 | -47.3 | 38.9 | 0.316 | 2.46 | 21.61 | 11552 | 0.013 | 35894 |
| CORAL HARBOUR | 64.20 | -83.40 | 0.522 | 85.2 | -25 | 17.52 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| CRACOW | 50.05 | 19.95 | 0.422 | 65.4 | 1 | 2.17 | -37.8 | 86.7 | 0.298 | 4.02 | 25.37 | 7184 | 0.031 | 23361 |
| CURACAO | 12.08 | -68.84 | 0.347 | 43.3 | -3 | 1.33 | -40.1 | -69.9 | 0.264 | -15.34 | -67.85 | 1766 | 0.133 | 7733 |
| CUZCO | -13.52 | -71.98 | 0.242 | -0.8 | 3 | 1.09 | -12.7 | -71.9 | 0.243 | NO MINIMUM B BETWEEN INTERS. | | | | 94 |
| DAVIS | -68.60 | 78.00 | 0.491 | -74.3 | -68 | 15.24 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| DAPANGO | 10.80 | 0.07 | 0.276 | 5.4 | -10 | 1.05 | 6.1 | 1.0 | 0.269 | 6.64 | 0.92 | 305 | 0.269 | 555 |
| DALLAS | 32.78 | -96.80 | 0.461 | 62.8 | 9 | 1.96 | -51.3 | -116.4 | 0.430 | -10.01 | -102.73 | 6145 | 0.041 | 20497 |
| DAKAR | 14.66 | -17.43 | 0.285 | 21.8 | -13 | 1.11 | -6.2 | -11.5 | 0.248 | 1.72 | -13.90 | 549 | 0.225 | 2656 |
| DARWIN-COONAWARRA | -12.43 | 130.90 | 0.401 | -39.6 | 3 | 1.14 | 28.8 | 131.7 | 0.383 | 8.82 | 131.85 | 1344 | 0.208 | 5819 |
| DEBRECEN | 47.48 | 21.65 | 0.416 | 63.1 | 1 | 1.96 | -34.0 | 85.3 | 0.295 | 4.62 | 26.01 | 5876 | 0.042 | 19554 |
| DE BILT | 52.10 | 5.18 | 0.419 | 67.1 | -5 | 2.52 | -44.2 | 29.7 | 0.294 | 1.78 | 14.50 | 9195 | 0.020 | 29273 |
| DEEP RIVER | 46.10 | -77.50 | 0.507 | 75.4 | -9 | 3.92 | -72.3 | -96.8 | 0.477 | -12.40 | -76.30 | 18481 | 0.005 | 55331 |
| DENVER | 39.75 | -105.00 | 0.486 | 67.7 | 13 | 2.41 | -54.5 | -131.1 | 0.475 | -8.11 | -113.63 | 9089 | 0.022 | 28734 |
| DEHRA DUN | 30.33 | 78.05 | 0.420 | 44.5 | 0 | 1.17 | -12.2 | 80.8 | 0.378 | 8.31 | 78.84 | 1542 | 0.192 | 6276 |
| DELHI | 28.63 | 77.22 | 0.411 | 41.7 | -0 | 1.13 | -10.6 | 79.8 | 0.370 | 8.09 | 78.01 | 1335 | 0.210 | 5585 |
| DECEPCION | -62.98 | -60.72 | 0.366 | -57.4 | 14 | 2.29 | 34.6 | -54.7 | 0.453 | -13.02 | -59.00 | 7921 | 0.026 | 26048 |
| DIXON ISLAND | 73.53 | 80.70 | 0.503 | 83.5 | 19 | 7.03 | -54.1 | 100.3 | 0.529 | 10.20 | 85.74 | 38727 | 0.001 | 110374 |
| DJIBOUTI | 11.55 | 43.15 | 0.311 | 6.5 | 1 | 1.01 | 6.1 | 43.1 | 0.301 | 6.97 | 43.14 | 310 | 0.300 | 639 |
| DJAKARTA | -6.17 | 107.00 | 0.381 | -32.7 | 1 | 1.05 | 24.2 | 107.3 | 0.392 | 8.75 | 107.23 | 677 | 0.265 | 3963 |
| DODAIRA | 36.00 | 139.20 | 0.402 | 49.3 | -4 | 1.30 | -19.0 | 137.4 | 0.436 | 9.11 | 139.29 | 2288 | 0.143 | 8922 |
| DOLGOPRUDNAYA | 55.94 | 37.52 | 0.452 | 71.0 | 8 | 2.70 | -43.0 | 56.4 | 0.353 | 5.58 | 41.90 | 10687 | 0.016 | 33149 |
| DOURBES | 50.10 | 4.60 | 0.414 | 65.5 | -5 | 2.31 | -41.4 | 27.0 | 0.287 | 2.06 | 13.30 | 7918 | 0.026 | 25611 |
| DUNSINK | 53.38 | -6.33 | 0.423 | 68.6 | -11 | 2.88 | -50.4 | 25.1 | 0.302 | -0.13 | 6.17 | 11436 | 0.013 | 35772 |
| DUSHETTI | 42.08 | 44.70 | 0.429 | 59.5 | 5 | 1.61 | -26.5 | 51.2 | 0.321 | 6.42 | 45.59 | 3941 | 0.075 | 13752 |
| DURHAM | 43.08 | -70.92 | 0.491 | 72.9 | -13 | 3.33 | -71.1 | -77.7 | 0.442 | -12.60 | -66.65 | 14617 | 0.008 | 44719 |
| DUMONT D'URVILLE | -66.67 | 140.02 | 0.580 | -89.6 | -58 | 35.99 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| DURBAN | -29.83 | 31.03 | 0.292 | -63.4 | -19 | 1.75 | 44.4 | 19.4 | 0.405 | 4.86 | 23.41 | 4657 | 0.058 | 15991 |
| EDINBURGH | 55.92 | -3.18 | 0.428 | 70.2 | -10 | 3.19 | -52.6 | 30.5 | 0.317 | 0.01 | 9.76 | 13456 | 0.010 | 41443 |
| EIGHTS | -75.23 | -77.17 | 0.462 | -67.8 | 31 | 4.17 | 47.4 | -70.1 | 0.500 | -12.30 | -64.74 | 19998 | 0.004 | 59720 |
| ELLSWORTH | -77.72 | -41.13 | 0.446 | -67.2 | 8 | 4.81 | 51.2 | -59.9 | 0.488 | -11.07 | -48.59 | 23935 | 0.003 | 70860 |
| ELISABETHVILLE | -11.63 | 27.42 | 0.294 | -45.9 | -7 | 1.22 | 30.8 | 24.2 | 0.360 | 7.26 | 25.34 | 1485 | 0.169 | 6192 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** | O R I G I N | | | | | ** CONJUGATE INTERS. | | | ** MINIMUM-B E Q U A T O R | | | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| ENNADAI | | 61.30 | -117.20 | 0.530 | 83.6 | 16 | 10.16 | -72.5 | -163.8 | 0.558 | -7.86 | -116.05 | 58505 | 0.000 | 165589 |
| ENUGU | | 6.47 | 7.55 | 0.275 | -7.5 | -9 | 1.04 | 12.8 | 6.5 | 0.284 | 7.96 | 7.29 | 318 | 0.274 | 751 |
| ESKDALEMUIR | | 55.32 | -3.20 | 0.427 | 69.8 | -10 | 3.10 | -51.8 | 29.6 | 0.313 | 0.17 | 9.44 | 12837 | 0.011 | 39696 |
| ESPERANZA | | -63.38 | -56.98 | 0.363 | -57.4 | 12 | 2.33 | 35.2 | -53.2 | 0.453 | -12.95 | -56.79 | 8158 | 0.024 | 26744 |
| EUREKA | | 80.00 | -85.93 | 0.503 | 88.0 | 73 | 317.06 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | | ** | |
| FAREWELL | | 62.53 | -153.90 | 0.487 | 74.6 | 24 | 4.49 | -53.6 | 168.8 | 0.553 | 3.30 | -172.74 | 22954 | 0.003 | 65870 |
| FANNING ISLAND | | 3.92 | -159.38 | 0.289 | 9.8 | 10 | 1.03 | -5.5 | -161.1 | 0.302 | 0.86 | -159.93 | 342 | 0.285 | 1121 |
| FLIN FLON | | 54.70 | -102.00 | 0.528 | 79.6 | 15 | 5.75 | -68.2 | -148.8 | 0.541 | -8.44 | -114.10 | 30402 | 0.002 | 87905 |
| FORT YUKON | | 66.57 | -145.30 | 0.503 | 78.6 | 31 | 6.77 | -58.9 | 167.2 | 0.567 | 2.74 | -169.23 | 37132 | 0.001 | 106105 |
| FORT NORMAN | | 64.90 | -125.50 | 0.518 | 81.1 | 25 | 8.58 | -64.4 | 177.4 | 0.567 | -1.42 | -149.79 | 48635 | 0.000 | 137980 |
| FORT CHIMO | | 58.10 | -68.43 | 0.508 | 80.5 | -31 | 8.71 | -65.1 | -81.5 | 0.505 | -11.68 | -59.54 | 48857 | 0.000 | 139727 |
| FORT MONMOUTH | | 40.25 | -74.02 | 0.488 | 71.2 | -9 | 2.93 | -67.8 | -84.6 | 0.436 | -12.85 | -71.70 | 12106 | 0.012 | 37634 |
| FORT BELVOIR | | 38.73 | -77.13 | 0.486 | 70.3 | -5 | 2.73 | -65.5 | -90.8 | 0.437 | -12.89 | -76.47 | 10901 | 0.015 | 34188 |
| FORT RANDOLPH | | 9.38 | -79.88 | 0.336 | 38.0 | 3 | 1.23 | -33.5 | -85.4 | 0.278 | -13.69 | -81.64 | 1314 | 0.165 | 6017 |
| FORT DE FRANCE | | 14.10 | -61.02 | 0.349 | 44.8 | -9 | 1.36 | -41.2 | -55.5 | 0.244 | -14.80 | -57.26 | 1948 | 0.122 | 8417 |
| FREETOWN | | 8.47 | -13.22 | 0.266 | 7.2 | -14 | 1.07 | 2.0 | -11.5 | 0.254 | 3.04 | -11.76 | 314 | 0.254 | 739 |
| FROBISHER | | 63.75 | -68.57 | 0.508 | 82.7 | -40 | 15.36 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | | ** | |
| FREIBURG | | 48.05 | 7.58 | 0.409 | 63.6 | -4 | 2.10 | -37.4 | 26.6 | 0.285 | 2.77 | 14.93 | 6596 | 0.035 | 21752 |
| FRONT ROYAL | | 38.93 | -78.18 | 0.488 | 70.4 | -5 | 2.75 | -65.4 | -93.1 | 0.440 | -12.72 | -77.99 | 11032 | 0.015 | 34533 |
| FT. DAVIS | | 30.63 | -103.95 | 0.441 | 59.0 | 11 | 1.74 | -45.0 | -122.1 | 0.419 | -8.49 | -110.50 | 4808 | 0.058 | 16641 |
| GARCHY | | 47.30 | 3.07 | 0.406 | 63.1 | -6 | 2.08 | -37.6 | 23.1 | 0.282 | 2.05 | 11.21 | 6461 | 0.036 | 21410 |
| GAINESVILLE | | 29.63 | -82.30 | 0.450 | 62.2 | 1 | 1.91 | -34.5 | -95.9 | 0.394 | -12.70 | -84.36 | 5728 | 0.043 | 19465 |
| GENOVA MONTE CAPEL | | 44.55 | 8.95 | 0.400 | 60.2 | -3 | 1.82 | -31.9 | 24.1 | 0.284 | 3.56 | 14.98 | 4971 | 0.052 | 16990 |
| GENERAL BELGRANO | | -77.97 | -38.80 | 0.446 | -67.4 | 6 | 4.92 | 51.6 | -59.3 | 0.488 | -11.05 | -47.66 | 24625 | 0.003 | 72785 |
| GENERAL SAN MARTIN | | -68.13 | -67.43 | 0.409 | -61.9 | 21 | 2.82 | 39.7 | -87.4 | 0.476 | -12.79 | -61.94 | 11367 | 0.014 | 35706 |
| GHANA | | 10.00 | 4.00 | 0.277 | 1.9 | -9 | 1.04 | 8.4 | 4.3 | 0.275 | NO MINIMUM B BETWEEN INTERS. | | | | 193 |
| GIFU | | 35.58 | 137.08 | 0.405 | 49.1 | -5 | 1.29 | -18.6 | 135.6 | 0.435 | 9.16 | 137.28 | 2229 | 0.146 | 8722 |
| GILGIT | | 35.94 | 74.30 | 0.445 | 53.2 | 1 | 1.32 | -18.5 | 78.4 | 0.389 | 7.90 | 75.17 | 2471 | 0.133 | 9202 |
| GOUGH ISLAND | | -40.35 | -9.89 | 0.252 | -56.9 | -25 | 1.76 | 34.2 | -33.6 | 0.385 | -5.32 | -22.55 | 4370 | 0.058 | 15663 |
| GODHAVN | | 69.23 | -53.52 | 0.491 | 81.9 | -48 | 22.19 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | | ** | |
| GOOSE BAY | | 53.32 | -60.38 | 0.492 | 76.8 | -28 | 5.56 | -79.8 | -40.3 | 0.459 | -11.09 | -48.61 | 28682 | 0.002 | 84020 |
| GOTTINGEN | | 51.53 | 9.93 | 0.419 | 66.6 | -3 | 2.40 | -42.0 | 31.9 | 0.294 | 2.46 | 17.97 | 8483 | 0.023 | 27189 |
| GRYTVIKEN | | -54.27 | -36.50 | 0.287 | -52.3 | -5 | 1.91 | 30.8 | -53.6 | 0.414 | -11.47 | -44.74 | 5337 | 0.045 | 18731 |
| GRAZ | | 47.07 | 15.47 | 0.411 | 62.6 | -0 | 1.96 | -34.3 | 50.6 | 0.290 | 3.96 | 20.88 | 5826 | 0.042 | 19454 |
| GROCKA | | 44.63 | 20.77 | 0.407 | 60.3 | 0 | 1.77 | -30.0 | 32.2 | 0.293 | 4.86 | 24.58 | 4730 | 0.057 | 16199 |
| GRAND BAHAMA | | 26.67 | -78.37 | 0.434 | 59.7 | -0 | 1.77 | -52.9 | -88.5 | 0.367 | -13.23 | -79.25 | 4801 | 0.055 | 16853 |
| GRAHAMSTOWN | | -33.28 | 26.48 | 0.286 | -64.6 | -23 | 1.89 | 45.8 | 10.9 | 0.404 | 3.44 | 16.93 | 5416 | 0.047 | 18288 |
| GREAT WHALE RIVER | | 55.27 | -77.78 | 0.519 | 80.7 | -18 | 7.22 | -80.0 | -113.6 | 0.516 | -11.89 | -75.87 | 39468 | 0.001 | 113617 |
| GULMARG | | 34.05 | 74.40 | 0.436 | 50.5 | 1 | 1.27 | -16.5 | 78.1 | 0.383 | 7.91 | 75.26 | 2128 | 0.151 | 8152 |
| GUANTANAMO BAY | | 19.90 | -75.15 | 0.396 | 52.8 | -0 | 1.51 | -46.9 | -81.4 | 0.319 | -13.98 | -75.46 | 3062 | 0.089 | 11753 |
| GUAM | | 13.45 | 144.75 | 0.316 | 11.7 | 2 | 1.01 | 2.1 | 144.2 | 0.328 | 8.82 | 144.58 | 366 | 0.307 | 1339 |
| GUAYAQUIL | | -2.17 | -79.88 | 0.280 | 18.4 | 5 | 1.10 | -21.2 | -82.2 | 0.249 | -13.79 | -81.07 | 477 | 0.232 | 2310 |
| HAMMAGHIR | | 30.10 | 0. | 0.344 | 42.6 | -7 | 1.27 | -14.6 | 9.1 | 0.277 | 4.97 | 4.45 | 1621 | 0.151 | 6751 |
| HACHIJOJIMA | | 33.13 | 139.80 | 0.387 | 45.5 | -4 | 1.23 | -16.4 | 138.2 | 0.420 | 8.92 | 139.82 | 1846 | 0.168 | 7543 |
| HALLETT | | -72.32 | 170.22 | 0.573 | -84.8 | -78 | 22.17 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | | ** | |
| HARTLAND | | 51.00 | -4.48 | 0.416 | 66.6 | -9 | 2.54 | -46.1 | 23.0 | 0.289 | 0.30 | 6.66 | 9302 | 0.020 | 29680 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** | D | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| HARVSTVA | | 60.22 | 10.25 | 0.438 | 72.7 | -3 | 3.69 | -53.6 | 44.5 | 0.349 | 1.89 | 22.10 | 16722 | 0.006 | 30439 |
| HAMBURG | | 53.63 | 10.00 | 0.424 | 68.2 | -3 | 2.63 | -45.1 | 34.5 | 0.303 | 2.51 | 18.77 | 9972 | 0.018 | 31436 |
| HALLE | | 51.48 | 11.93 | 0.420 | 66.5 | -2 | 2.37 | -41.5 | 33.0 | 0.295 | 3.00 | 19.46 | 8341 | 0.024 | 26759 |
| HALIFAX | | 44.60 | -63.60 | 0.482 | 72.6 | -20 | 3.47 | -72.4 | -56.4 | 0.422 | -12.29 | -55.50 | 15391 | 0.007 | 47031 |
| HANNOVER USA | | 43.70 | -72.30 | 0.495 | 73.4 | -13 | 3.44 | -71.4 | -61.7 | 0.450 | -12.71 | -68.64 | 15362 | 0.007 | 46767 |
| HABANA | | 23.15 | -82.35 | 0.415 | 55.5 | 2 | 1.59 | -47.6 | -93.2 | 0.353 | -12.93 | -84.61 | 3649 | 0.076 | 13414 |
| HALLEY BAY | | -75.52 | -26.60 | 0.424 | -65.7 | -2 | 4.47 | 50.9 | -54.9 | 0.478 | -10.63 | -41.68 | 21702 | 0.003 | 64729 |
| HAIFA | | 32.83 | 35.10 | 0.381 | 46.5 | 3 | 1.27 | -15.1 | 37.6 | 0.300 | 6.76 | 35.55 | 1848 | 0.149 | 7380 |
| HAMILTON MASS. | | 42.02 | -72.17 | 0.490 | 72.3 | -12 | 3.17 | -69.9 | -80.6 | 0.440 | -12.60 | -68.68 | 13630 | 0.010 | 41935 |
| HERSTMONCEUX | | 50.90 | 0.33 | 0.416 | 66.3 | -7 | 2.45 | -44.1 | 25.5 | 0.289 | 1.14 | 10.33 | 8763 | 0.022 | 28086 |
| HEISS | | 80.20 | 57.48 | 0.490 | 84.1 | 19 | 13.64 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | | | ** |
| HEALY | | 63.85 | -119.00 | 0.522 | 81.8 | 33 | 8.98 | -66.2 | -178.0 | 0.566 | -3.08 | -141.72 | 51178 | 0.000 | 145071 |
| HEL | | 54.60 | 18.80 | 0.431 | 69.0 | 1 | 2.66 | -44.3 | 41.3 | 0.315 | 3.46 | 26.03 | 10204 | 0.017 | 32004 |
| HELWAN | | 29.87 | 31.33 | 0.364 | 41.3 | 2 | 1.20 | -11.1 | 33.3 | 0.296 | 7.30 | 31.81 | 1397 | 0.178 | 5883 |
| HERMANUS | | -34.42 | 19.22 | 0.279 | -64.4 | -25 | 1.89 | 44.7 | 0.7 | 0.398 | 2.10 | 8.54 | 5381 | 0.046 | 18269 |
| HIRAISO | | 36.37 | 140.62 | 0.401 | 49.6 | -4 | 1.31 | -19.4 | 138.6 | 0.438 | 9.05 | 140.62 | 2344 | 0.139 | 9105 |
| HIGHCLIFF | | -45.88 | 170.58 | 0.527 | -71.1 | 22 | 2.86 | 55.8 | -162.6 | 0.455 | 4.32 | -175.86 | 12074 | 0.013 | 36915 |
| HONOLULU | | 21.30 | -158.10 | 0.318 | 38.7 | 11 | 1.19 | -20.4 | -166.6 | 0.369 | 1.58 | -161.96 | 1336 | 0.188 | 5961 |
| HOBART | | -42.92 | 147.17 | 0.546 | -72.9 | 13 | 2.98 | 60.5 | 161.4 | 0.472 | 8.38 | 155.12 | 12928 | 0.012 | 39083 |
| HOLLANDIA | | -2.50 | 140.52 | 0.346 | -21.1 | 4 | 1.03 | 18.2 | 141.3 | 0.328 | 8.74 | 141.08 | 535 | 0.287 | 2532 |
| HURBANOVO | | 47.90 | 18.20 | 0.415 | 63.4 | 0 | 2.01 | -35.0 | 33.3 | 0.293 | 4.13 | 23.32 | 6138 | 0.040 | 20344 |
| HUMAIN | | 50.20 | 5.35 | 0.415 | 65.5 | -5 | 2.31 | -41.3 | 27.6 | 0.288 | 2.18 | 13.91 | 7929 | 0.026 | 25636 |
| HUANCAYO | | -12.05 | -75.33 | 0.248 | 1.1 | 4 | 1.08 | -13.1 | -75.4 | 0.246 | NO MINIMUM B BETWEEN | | | INTERS. | 128 |
| HYDERABAD | | 17.42 | 78.45 | 0.361 | 19.2 | -1 | 1.00 | 1.1 | 79.4 | 0.344 | 8.41 | 78.92 | 464 | 0.314 | 1970 |
| IBADAN | | 7.37 | 3.97 | 0.273 | -4.0 | -10 | 1.05 | 10.8 | 3.3 | 0.278 | NO MINIMUM B BETWEEN | | | INTERS. | 407 |
| I. CROZET | | -46.50 | 52.00 | 0.347 | -65.6 | -38 | 2.99 | 57.8 | 28.5 | 0.446 | 4.51 | 35.07 | 12490 | 0.012 | 38340 |
| IL GORTIN | | 36.22 | 14.30 | 0.373 | 50.1 | -2 | 1.39 | -19.1 | 22.1 | 0.290 | 5.84 | 17.50 | 2441 | 0.114 | 9314 |
| INUVIK | | 68.20 | -133.70 | 0.513 | 81.4 | 37 | 9.70 | -63.3 | 168.4 | 0.572 | 0.77 | -161.40 | 55888 | 0.000 | 157906 |
| INVERCARGILL | | -46.42 | 168.32 | 0.532 | -71.9 | 22 | 3.00 | 57.2 | -164.7 | 0.459 | 4.76 | -178.07 | 12984 | 0.012 | 39424 |
| INVERNESS | | 57.45 | -4.25 | 0.432 | 71.2 | -11 | 3.49 | -55.1 | 32.4 | 0.330 | -0.33 | 9.71 | 15389 | 0.007 | 46887 |
| IQUITOS | | -3.67 | -73.33 | 0.271 | 17.6 | 2 | 1.11 | -22.3 | -74.6 | 0.238 | -15.64 | -73.94 | 457 | 0.225 | 2242 |
| IRKUTSK | | 52.27 | 104.30 | 0.514 | 71.0 | -2 | 2.12 | -33.6 | 107.9 | 0.505 | 9.95 | 105.44 | 7628 | 0.032 | 23959 |
| ISLA DE PASCUA | | -27.17 | -109.43 | 0.307 | -36.3 | 14 | 1.18 | 12.4 | -102.2 | 0.337 | -8.33 | -105.42 | 1188 | 0.186 | 5487 |
| ISEFJORD | | 78.07 | 13.63 | 0.474 | 81.7 | -6 | 15.17 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | | | | ** |
| ITHACA | | 42.45 | -76.52 | 0.497 | 72.9 | -8 | 3.25 | -59.2 | -91.6 | 0.455 | -12.59 | -75.18 | 14152 | 0.009 | 43293 |
| IVALO | | 68.60 | 27.48 | 0.462 | 77.7 | 6 | 5.77 | -57.7 | 67.9 | 0.433 | 4.61 | 40.62 | 30222 | 0.002 | 87647 |
| JICAMARCA | | -11.95 | -76.87 | 0.249 | 0.7 | 5 | 1.08 | -12.7 | -76.9 | 0.248 | NO MINIMUM B BETWEEN | | | INTERS. | 86 |
| JODRELL BANK | | 53.23 | -2.30 | 0.422 | 68.2 | -9 | 2.77 | -48.5 | 27.1 | 0.299 | 0.27 | 9.26 | 10789 | 0.015 | 33899 |
| JOHANNESBURG | | -26.20 | 28.03 | 0.291 | -61.6 | -17 | 1.61 | 41.7 | 18.1 | 0.396 | 4.94 | 21.70 | 3785 | 0.074 | 13408 |
| JUPITER | | 27.02 | -80.12 | 0.436 | 59.9 | 0 | 1.78 | -52.6 | -91.4 | 0.373 | -13.11 | -81.57 | 4664 | 0.054 | 17009 |
| JULIANEHAAB | | 60.72 | -46.03 | 0.476 | 77.4 | -35 | 7.69 | -78.8 | 16.5 | 0.454 | -8.38 | -26.10 | 42206 | 0.001 | 121614 |
| JULIUSRUH-RUGEN | | 54.63 | 13.38 | 0.428 | 68.9 | -1 | 2.72 | -45.6 | 37.9 | 0.310 | 2.88 | 21.78 | 10534 | 0.016 | 32999 |
| JUNGFRAUJOCH | | 46.55 | 7.98 | 0.405 | 62.2 | -3 | 1.97 | -35.1 | 25.3 | 0.284 | 3.09 | 14.78 | 5854 | 0.042 | 19592 |
| KANOYA | | 31.42 | 130.89 | 0.397 | 44.4 | -3 | 1.19 | -14.8 | 130.1 | 0.415 | 8.76 | 131.17 | 1653 | 0.184 | 6851 |
| KARACHI | | 24.85 | 67.02 | 0.385 | 36.0 | -0 | 1.09 | -8.1 | 69.3 | 0.341 | 7.27 | 67.73 | 1004 | 0.235 | 4433 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** D I P | | | | | | ** CONJUGATE | | | INTERS. ** MINIMUM-B E Q U A T O R | | | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| KAZACHIE | 70.70 | 136.40 | 0.509 | 80.8 | -8 | 5.35 | -50.2 | 128.6 | 0.569 | 10.51 | 131.51 | 28170 | 0.002 | 81003 |
| KAP TOBIN | 70.42 | -21.97 | 0.465 | 79.0 | -28 | 11.62 | -72.5 | 59.3 | 0.466 | -2.03 | 6.88 | 67347 | 0.000 | 190926 |
| KAZAN | 55.83 | 48.82 | 0.467 | 71.8 | 10 | 2.64 | -41.5 | 65.1 | 0.382 | 6.38 | 51.90 | 10474 | 0.017 | 32400 |
| KAKIOKA | 36.23 | 140.18 | 0.401 | 49.5 | -4 | 1.31 | -19.3 | 138.2 | 0.437 | 8.98 | 140.20 | 2322 | 0.141 | 9035 |
| KAMPALA | 0.33 | 32.58 | 0.291 | -22.8 | -1 | 1.06 | 19.6 | 32.2 | 0.324 | 8.12 | 32.32 | 522 | 0.264 | 2354 |
| KEKAHA | 21.84 | -159.72 | 0.319 | 39.0 | 12 | 1.19 | -20.4 | -158.3 | 0.371 | 1.87 | -163.65 | 1362 | 0.186 | 6053 |
| KHARTOUM | 15.58 | 32.58 | 0.311 | 12.9 | 0 | 1.03 | 4.5 | 32.7 | 0.292 | 8.15 | 32.63 | 367 | 0.286 | 1312 |
| KHABAROVSK | 48.52 | 135.12 | 0.467 | 63.8 | -8 | 1.80 | -30.3 | 132.8 | 0.503 | 9.58 | 135.33 | 5528 | 0.053 | 18281 |
| KHARKOV | 50.00 | 36.23 | 0.439 | 66.3 | 6 | 2.11 | -36.1 | 49.3 | 0.322 | 5.54 | 39.12 | 6949 | 0.034 | 22546 |
| KIEL | 54.30 | 10.10 | 0.426 | 68.7 | -3 | 2.71 | -46.0 | 35.5 | 0.306 | 2.40 | 19.13 | 10495 | 0.016 | 32922 |
| KIRUNA | 67.83 | 20.43 | 0.457 | 77.0 | 2 | 5.67 | -58.6 | 63.2 | 0.421 | 3.59 | 34.81 | 29532 | 0.002 | 85852 |
| KING SALMON | 58.70 | -156.70 | 0.472 | 71.5 | 21 | 3.48 | -49.8 | 171.4 | 0.540 | 3.49 | -172.60 | 16060 | 0.007 | 47948 |
| KIEV | 50.45 | 30.50 | 0.433 | 66.3 | 5 | 2.16 | -37.1 | 45.0 | 0.313 | 4.84 | 34.28 | 7215 | 0.031 | 23363 |
| KINGSTON | 18.00 | -76.80 | 0.386 | 50.3 | 0 | 1.44 | -44.3 | -83.6 | 0.313 | -13.95 | -77.73 | 2646 | 0.102 | 10452 |
| KNOB LAKE | 54.80 | -66.82 | 0.504 | 78.8 | -27 | 6.59 | -82.2 | -67.9 | 0.487 | -11.56 | -57.93 | 35327 | 0.001 | 102314 |
| KOROR ISLAND | 7.16 | 123.48 | 0.338 | -1.4 | 1 | 0.97 | 8.4 | 123.5 | 0.338 | 7.96 | 123.50 | 301 | 0.338 | 150 |
| KOTZEBUE | 66.88 | -162.60 | 0.491 | 76.7 | 21 | 5.46 | -54.6 | 159.9 | 0.565 | 5.20 | 177.53 | 28770 | 0.002 | 82959 |
| KOLN | 50.93 | 6.92 | 0.417 | 66.1 | -4 | 2.37 | -42.0 | 29.3 | 0.291 | 2.26 | 15.39 | 8282 | 0.024 | 26639 |
| KOMURO | 35.98 | 139.62 | 0.401 | 49.2 | -4 | 1.30 | -19.0 | 137.8 | 0.436 | 9.07 | 139.68 | 2282 | 0.143 | 8909 |
| KOKUBUNJI | 35.70 | 139.48 | 0.400 | 48.9 | -4 | 1.29 | -18.8 | 137.7 | 0.434 | 9.12 | 139.55 | 2236 | 0.145 | 8767 |
| KODAIKANAL | 10.23 | 77.48 | 0.342 | 2.5 | -2 | 0.97 | 8.2 | 77.6 | 0.340 | NO MINIMUM B BETWEEN INTERS. | | | | 238 |
| KUHLUNGSBORN | 54.12 | 11.93 | 0.426 | 68.6 | -2 | 2.67 | -45.2 | 36.3 | 0.306 | 2.54 | 20.49 | 10220 | 0.017 | 32126 |
| KUMASI | 6.67 | -1.58 | 0.268 | -3.0 | -11 | 1.05 | 9.2 | -2.1 | 0.272 | NO MINIMUM B BETWEEN INTERS. | | | | 307 |
| KYOTO | 35.02 | 135.78 | 0.405 | 48.6 | -4 | 1.27 | -18.1 | 134.5 | 0.432 | 9.09 | 136.03 | 2145 | 0.151 | 8453 |
| L'AQUILA | 42.40 | 13.32 | 0.395 | 57.8 | -2 | 1.67 | -27.8 | 25.2 | 0.288 | 4.47 | 17.95 | 4082 | 0.067 | 14318 |
| LA MADDALENA | 41.22 | 9.40 | 0.389 | 56.5 | -3 | 1.62 | -26.9 | 21.8 | 0.286 | 4.33 | 14.49 | 3802 | 0.073 | 13503 |
| LAHORE | 31.55 | 74.33 | 0.424 | 46.7 | 0 | 1.20 | -13.9 | 77.6 | 0.374 | 7.85 | 75.17 | 1736 | 0.176 | 6918 |
| LA PLATA | -34.90 | -57.90 | 0.230 | -33.3 | 0 | 1.26 | 7.8 | -61.7 | 0.316 | -15.89 | -59.01 | 1215 | 0.158 | 5358 |
| LA QUIACA | -22.10 | -65.60 | 0.227 | -15.3 | 1 | 1.12 | -5.1 | -65.9 | 0.261 | -16.85 | -65.58 | 417 | 0.220 | 2033 |
| LA PAZ | -16.48 | -68.05 | 0.233 | -5.6 | 1 | 1.10 | -10.5 | -68.0 | 0.245 | NO MINIMUM B BETWEEN INTERS. | | | | 702 |
| LAE | -6.72 | 147.00 | 0.359 | -28.5 | 5 | 1.07 | 22.5 | 148.7 | 0.328 | 8.89 | 148.23 | 770 | 0.253 | 3729 |
| LA GRAU | 43.10 | 6.00 | 0.394 | 58.8 | -4 | 1.75 | -30.4 | 21.1 | 0.283 | 3.43 | 12.25 | 4534 | 0.059 | 15715 |
| LA HAYE | 52.10 | 4.30 | 0.419 | 67.1 | -5 | 2.53 | -44.5 | 29.2 | 0.294 | 1.68 | 13.82 | 9265 | 0.020 | 29482 |
| LEEDS | 53.80 | -1.55 | 0.423 | 68.6 | -8 | 2.84 | -49.1 | 28.2 | 0.302 | 0.53 | 10.04 | 11190 | 0.014 | 35024 |
| LEICESTER | 52.62 | -1.10 | 0.420 | 67.7 | -8 | 2.68 | -47.2 | 26.9 | 0.296 | 0.88 | 9.86 | 10161 | 0.017 | 32392 |
| LERWICK | 60.13 | -1.18 | 0.437 | 72.8 | -9 | 3.97 | -57.2 | 38.5 | 0.351 | 0.15 | 13.49 | 18486 | 0.005 | 55507 |
| LENINGRAD | 59.95 | 30.70 | 0.451 | 73.1 | 6 | 3.33 | -48.6 | 36.4 | 0.366 | 4.82 | 37.78 | 14666 | 0.009 | 44407 |
| LEIDSCHENDAM | 52.08 | 4.38 | 0.419 | 67.1 | -5 | 2.53 | -44.4 | 29.3 | 0.294 | 1.68 | 13.87 | 9244 | 0.020 | 29421 |
| LEOPOLDVILLE | -4.37 | 15.25 | 0.281 | -32.8 | -9 | 1.12 | 24.1 | 11.5 | 0.323 | 7.65 | 13.40 | 802 | 0.221 | 3703 |
| LINDAU,HARZ | 51.65 | 10.13 | 0.420 | 66.6 | -3 | 2.41 | -42.2 | 32.1 | 0.295 | 2.52 | 18.16 | 8550 | 0.023 | 27380 |
| LISBOA | 38.77 | -9.13 | 0.379 | 55.5 | -10 | 1.65 | -29.9 | 8.8 | 0.271 | 1.27 | -0.87 | 3627 | 0.070 | 13734 |
| LITTLE AMERICA | -78.18 | -162.17 | 0.553 | -80.3 | -79 | 13.73 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| LOGRONO | 42.45 | -2.50 | 0.391 | 58.7 | -8 | 1.79 | -32.3 | 15.5 | 0.277 | 1.93 | 5.41 | 4686 | 0.055 | 16242 |
| LOVOZERO | 67.99 | 35.08 | 0.467 | 77.8 | 10 | 5.34 | -55.6 | 70.6 | 0.436 | 5.62 | 45.86 | 27564 | 0.002 | 80168 |
| LONGYEARBYEN | 78.22 | 15.67 | 0.475 | 81.8 | -5 | 15.07 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| LONDON | 51.53 | 0.10 | 0.417 | 66.8 | -7 | 2.53 | -45.1 | 26.2 | 0.291 | 0.98 | 10.40 | 9222 | 0.020 | 29403 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** GEOGRAPHIC | | | | | | ** CONJUGATE | | INTERS. ** MINIMUM-B EQUATOR | | | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| LOMNICKY STIT | 49.20 | 20.22 | 0.420 | 64.7 | 1 | 2.10 | -36.6 | 36.0 | 0.297 | 4.06 | 25.35 | 6728 | 0.035 | 22041 |
| LOURENCO MARQUES | -25.97 | 32.60 | 0.295 | -61.2 | -16 | 1.61 | 41.8 | 24.1 | 0.402 | 5.39 | 26.78 | 3781 | 0.075 | 13366 |
| LUND | 55.70 | 13.18 | 0.430 | 69.7 | -1 | 2.86 | -47.1 | 39.2 | 0.316 | 2.52 | 22.12 | 11457 | 0.014 | 35617 |
| LUANDA | -8.82 | 13.22 | 0.281 | -40.1 | -12 | 1.18 | 27.2 | 7.5 | 0.333 | 6.75 | 10.31 | 1127 | 0.189 | 4983 |
| LULEA | 65.60 | 22.12 | 0.454 | 75.9 | 3 | 4.81 | -56.2 | 60.0 | 0.402 | 3.84 | 34.32 | 24056 | 0.003 | 70661 |
| LVOV | 49.82 | 24.02 | 0.425 | 65.3 | 2 | 2.13 | -37.0 | 39.4 | 0.302 | 4.33 | 28.65 | 6970 | 0.033 | 22712 |
| LWIRO | -2.25 | 28.80 | 0.290 | -29.0 | -3 | 1.08 | 22.5 | 27.8 | 0.330 | 8.23 | 28.18 | 678 | 0.243 | 3133 |
| LYCKSELE | 64.62 | 18.67 | 0.450 | 75.3 | 1 | 4.60 | -56.1 | 56.5 | 0.391 | 3.13 | 31.10 | 22633 | 0.003 | 66766 |
| MAKATEA | -16.20 | -148.20 | 0.323 | -26.8 | 12 | 1.10 | 11.3 | -143.1 | 0.300 | -1.54 | -145.33 | 718 | 0.238 | 3529 |
| MANILA | 14.52 | 121.00 | 0.347 | 14.5 | 0 | 0.99 | 1.4 | 120.7 | 0.348 | 8.18 | 120.90 | 398 | 0.324 | 1557 |
| MALVERN | 52.12 | -2.32 | 0.419 | 67.4 | -9 | 2.64 | -46.9 | 25.6 | 0.294 | 0.59 | 8.75 | 9902 | 0.018 | 31368 |
| MAJURO ISLAND | 7.08 | 171.13 | 0.296 | 4.8 | 9 | 1.02 | 2.4 | 170.3 | 0.304 | 6.90 | 171.10 | 302 | 0.296 | 556 |
| MADRID | 40.40 | -3.68 | 0.384 | 56.6 | -8 | 1.68 | -29.8 | 13.2 | 0.276 | 2.03 | 3.92 | 4041 | 0.066 | 14326 |
| MACAO | 22.20 | 113.55 | 0.379 | 29.7 | -0 | 1.04 | -5.1 | 113.1 | 0.374 | 8.52 | 113.46 | 754 | 0.278 | 3482 |
| MADRAS | 13.08 | 80.28 | 0.350 | 8.8 | -2 | 0.97 | 5.8 | 80.7 | 0.342 | 8.47 | 80.53 | 331 | 0.338 | 857 |
| MAWSON | -67.40 | 62.50 | 0.453 | -70.8 | -56 | 9.31 | 71.0 | -4.7 | 0.460 | 0.58 | 20.48 | 52670 | 0.000 | 150163 |
| MACQUARIE ISLAND | -54.30 | 158.60 | 0.565 | -79.1 | 26 | 5.46 | 57.2 | -154.9 | 0.491 | 5.44 | 175.61 | 28742 | 0.002 | 82870 |
| MARION ISLAND | -46.85 | 37.87 | 0.313 | -65.0 | -33 | 2.81 | 55.3 | 11.9 | 0.429 | 2.35 | 20.94 | 11176 | 0.014 | 34840 |
| MAUI,KIHEI | 20.80 | -156.50 | 0.318 | 38.3 | 11 | 1.18 | -20.5 | -164.9 | 0.367 | 1.32 | -160.30 | 1513 | 0.189 | 5679 |
| MCMURDO SOUND | -77.85 | 166.62 | 0.565 | -83.4 | -38 | 35.82 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| MEANOOK | 54.62 | -113.33 | 0.521 | 77.5 | 23 | 4.86 | -63.0 | -157.6 | 0.541 | -5.71 | -128.71 | 24778 | 0.003 | 72220 |
| MEUDON | 48.80 | 2.25 | 0.410 | 64.5 | -6 | 2.22 | -40.2 | 24.2 | 0.283 | 1.72 | 11.06 | 7312 | 0.030 | 23890 |
| MEMAMBETSU | 43.92 | 144.20 | 0.429 | 57.7 | -6 | 1.57 | -26.4 | 140.6 | 0.477 | 9.07 | 143.76 | 3972 | 0.081 | 13941 |
| MEXICO EL CERRILLO | 19.32 | -99.55 | 0.380 | 46.5 | 9 | 1.34 | -35.8 | -110.5 | 0.344 | -9.21 | -103.86 | 2189 | 0.127 | 8862 |
| MELBOURNE | -37.82 | 144.32 | 0.530 | -69.0 | 10 | 2.36 | 55.8 | 153.4 | 0.463 | 8.84 | 150.21 | 8994 | 0.024 | 28131 |
| MIDWAY ISLAND | 6.97 | 158.22 | 0.305 | 0.1 | 6 | 1.01 | 6.8 | 158.2 | 0.305 | NO MINIMUM B BETWEEN INTERS. | | | | 20 |
| MIEDZESZYN | 52.17 | 21.20 | 0.428 | 67.2 | 1 | 2.37 | -40.6 | 40.0 | 0.306 | 3.88 | 27.08 | 8397 | 0.024 | 26834 |
| MINNEAPOLIS | 44.97 | -93.23 | 0.512 | 74.0 | 6 | 3.42 | -64.7 | -123.6 | 0.497 | -10.42 | -99.59 | 15459 | 0.008 | 46612 |
| MIRNY | -66.57 | 92.92 | 0.521 | -77.7 | -74 | 20.94 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| MINA AGUILAR | -23.10 | -65.70 | 0.227 | -16.9 | 1 | 1.13 | -4.1 | -66.0 | 0.264 | -16.74 | -65.65 | 453 | 0.217 | 2282 |
| MOULD BAY | 76.20 | -119.40 | 0.513 | 87.3 | 62 | 38.84 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| MOSHIRI | 44.37 | 142.27 | 0.435 | 58.5 | -6 | 1.59 | -26.8 | 139.0 | 0.480 | 9.14 | 142.01 | 4107 | 0.078 | 14313 |
| MOCA | 3.35 | 8.67 | 0.274 | -14.9 | -9 | 1.06 | 15.9 | 6.6 | 0.292 | 7.87 | 7.89 | 390 | 0.265 | 1515 |
| MOSCOW | 55.47 | 37.32 | 0.451 | 70.6 | 8 | 2.64 | -42.5 | 35.7 | 0.350 | 5.39 | 41.60 | 10328 | 0.017 | 32142 |
| MOUNT WASHINGTON | 44.27 | -71.30 | 0.495 | 73.7 | -14 | 3.54 | -72.1 | -79.2 | 0.449 | -12.53 | -67.03 | 15939 | 0.007 | 48397 |
| MOUNT NORIKURA | 36.12 | 137.55 | 0.406 | 49.7 | -5 | 1.30 | -19.1 | 136.0 | 0.438 | 9.04 | 137.73 | 2316 | 0.141 | 8995 |
| MONT JOLI | 48.60 | -68.20 | 0.499 | 75.8 | -20 | 4.43 | -76.5 | -71.2 | 0.462 | -12.19 | -61.53 | 21548 | 0.004 | 64071 |
| MURCHISON BAY | 80.05 | 18.30 | 0.479 | 82.7 | -4 | 18.01 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| MURMANSK | 68.97 | 33.08 | 0.466 | 78.1 | 9 | 5.77 | -56.8 | 71.2 | 0.441 | 5.32 | 45.10 | 30292 | 0.002 | 87750 |
| MUNCHEN | 48.13 | 11.70 | 0.411 | 63.6 | -2 | 2.07 | -35.6 | 29.2 | 0.288 | 3.25 | 18.20 | 6453 | 0.036 | 21312 |
| NARSSARSSUAQ | 61.18 | -45.42 | 0.476 | 77.5 | -35 | 7.90 | -78.7 | 18.9 | 0.455 | -8.16 | -25.09 | 43514 | 0.001 | 125231 |
| NARYAN MAR | 67.50 | 53.00 | 0.483 | 78.8 | 16 | 4.90 | -52.2 | 79.8 | 0.460 | 7.29 | 59.93 | 24936 | 0.003 | 72595 |
| NATAL | -5.33 | -35.12 | 0.236 | -3.0 | -17 | 1.10 | -2.5 | -36.1 | 0.243 | NO MINIMUM B BETWEEN INTERS. | | | | 350 |
| NAIROBI | -1.28 | 36.80 | 0.293 | -25.1 | -1 | 1.06 | 20.2 | 36.6 | 0.331 | 7.64 | 36.55 | 980 | 0.259 | 2662 |
| NEUSTRELITZ | 53.28 | -13.08 | 0.425 | 69.0 | -14 | 3.04 | -53.4 | 21.4 | 0.308 | -1.73 | 0.93 | 12404 | 0.011 | 38588 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** | O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| NIAMEY | | 13.50 | 2.50 | 0.284 | 10.3 | -9 | 1.05 | 4.5 | 4.2 | 0.270 | 7.26 | 3.65 | 343 | 0.267 | 1681 |
| NITSANIM | | 31.73 | 34.60 | 0.376 | 44.7 | 3 | 1.24 | -13.7 | 56.8 | 0.299 | 6.98 | 34.99 | 1677 | 0.159 | 6821 |
| NIIGATA | | 37.70 | 138.82 | 0.411 | 51.5 | -5 | 1.35 | -20.6 | 136.9 | 0.446 | 9.05 | 138.94 | 2590 | 0.128 | 9837 |
| NICOSIA | | 35.17 | 33.28 | 0.388 | 49.6 | 3 | 1.34 | -17.6 | 36.8 | 0.300 | 6.66 | 34.03 | 2232 | 0.129 | 8604 |
| NOUVELLE AMSTERDAM | | -37.84 | 77.57 | 0.425 | -67.7 | -33 | 2.41 | 54.2 | 55.6 | 0.489 | 7.98 | 67.36 | 9198 | 0.022 | 28582 |
| NOVOLAZAREVSKAYA | | -70.77 | 11.85 | 0.396 | -65.4 | -26 | 4.92 | 56.6 | -57.2 | 0.457 | -6.77 | -18.75 | 24461 | 0.003 | 72456 |
| NORD | | 81.60 | -16.67 | 0.483 | 83.7 | -35 | 39.86 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| NORWAY STATION | | -70.50 | -2.53 | 0.387 | -64.0 | -18 | 4.19 | 52.5 | -43.2 | 0.459 | -7.94 | -27.03 | 19826 | 0.004 | 59574 |
| NORFOLK ISLAND | | -29.00 | 167.60 | 0.456 | -56.4 | 14 | 1.57 | 40.8 | -179.7 | 0.374 | 6.17 | 174.47 | 3763 | 0.083 | 13550 |
| NOUMEA | | -22.30 | -166.40 | 0.378 | -41.5 | 14 | 1.22 | 23.2 | -156.9 | 0.326 | 1.53 | -161.27 | 1558 | 0.172 | 6735 |
| NURMIJARVI | | 60.50 | 24.65 | 0.447 | 73.2 | 4 | 3.50 | -50.4 | 93.3 | 0.362 | 3.97 | 33.24 | 15668 | 0.007 | 47295 |
| ODESSA | | 46.78 | 30.88 | 0.424 | 63.0 | 4 | 1.88 | -32.3 | 41.9 | 0.305 | 5.41 | 33.67 | 5496 | 0.047 | 18585 |
| O'HIGGINS RISUPAIR | | -63.32 | -57.90 | 0.364 | -57.4 | 12 | 2.33 | 35.1 | -63.6 | 0.453 | -12.98 | -57.33 | 8116 | 0.025 | 26620 |
| OKINAWA | | 26.50 | 128.00 | 0.379 | 37.2 | -2 | 1.10 | -10.3 | 127.4 | 0.391 | 8.52 | 128.13 | 1120 | 0.230 | 4999 |
| OLENEK | | 68.50 | 112.40 | 0.518 | 81.7 | -4 | 4.71 | -48.1 | 115.7 | 0.554 | 10.80 | 112.42 | 24096 | 0.003 | 69702 |
| ONAGAWA | | 38.43 | 141.47 | 0.409 | 52.0 | -5 | 1.37 | -21.3 | 139.1 | 0.449 | 9.12 | 141.41 | 2715 | 0.122 | 10236 |
| OOHIRA | | 35.62 | 140.50 | 0.397 | 48.7 | -4 | 1.29 | -18.7 | 138.6 | 0.434 | 9.02 | 140.50 | 2219 | 0.146 | 8721 |
| ORCADAS DEL SUR | | -60.73 | -44.73 | 0.331 | -55.4 | 3 | 2.20 | 34.3 | -68.1 | 0.439 | -12.34 | -49.84 | 7226 | 0.029 | 24162 |
| OSLO KJELLER | | 59.97 | 11.10 | 0.438 | 72.5 | -2 | 3.62 | -53.1 | 44.5 | 0.347 | 2.27 | 22.55 | 16283 | 0.007 | 49195 |
| OTTAWA | | 45.40 | -75.75 | 0.503 | 74.8 | -11 | 3.78 | -72.2 | -91.9 | 0.469 | -12.36 | -73.68 | 17527 | 0.006 | 52715 |
| OULU | | 65.00 | 25.52 | 0.455 | 75.8 | 5 | 4.55 | -54.9 | 60.8 | 0.400 | 4.02 | 36.52 | 22432 | 0.003 | 66103 |
| PALESTINE | | 31.77 | -95.63 | 0.457 | 62.0 | 8 | 1.90 | -50.8 | -114.4 | 0.423 | -10.33 | -101.23 | 5802 | 0.044 | 19529 |
| PANSKA VES | | 50.53 | 14.57 | 0.419 | 65.7 | -1 | 2.26 | -39.5 | 33.6 | 0.295 | 3.30 | 21.23 | 7636 | 0.028 | 24709 |
| PARIS-SACLAY | | 48.12 | 2.33 | 0.408 | 63.9 | -6 | 2.16 | -39.1 | 23.5 | 0.282 | 1.87 | 10.89 | 6933 | 0.032 | 22787 |
| PARIS-BAGNEUX | | 48.80 | 2.32 | 0.410 | 64.5 | -6 | 2.22 | -40.2 | 24.2 | 0.284 | 1.73 | 11.12 | 7307 | 0.030 | 23575 |
| PANAGURITSCH | | 42.52 | 24.18 | 0.404 | 58.1 | 1 | 1.64 | -26.9 | 33.2 | 0.295 | 5.50 | 26.99 | 3987 | 0.071 | 13975 |
| PARAMARIBO | | 5.82 | -55.22 | 0.297 | 31.2 | -11 | 1.23 | -29.3 | -48.6 | 0.216 | -15.02 | -51.30 | 910 | 0.174 | 4559 |
| PETROPAVLOVSK-ON-K | | 52.98 | 158.65 | 0.445 | 64.7 | -3 | 2.12 | -35.7 | 148.7 | 0.316 | 8.63 | 154.98 | 7443 | 0.033 | 23563 |
| PEARCE | | -31.67 | 115.97 | 0.506 | -66.2 | -2 | 1.94 | 50.3 | 114.5 | 0.504 | 9.76 | 115.54 | 6520 | 0.042 | 20396 |
| PIC DU MIDI | | 42.93 | 0.25 | 0.392 | 59.0 | -7 | 1.79 | -32.0 | 17.5 | 0.279 | 2.43 | 7.68 | 4721 | 0.055 | 16319 |
| PILAR | | -31.67 | -63.88 | 0.232 | -29.2 | 3 | 1.20 | 4.1 | -65.1 | 0.301 | -16.15 | -63.82 | 923 | 0.179 | 4567 |
| PIWNICE -TORUN | | 50.52 | 14.57 | 0.419 | 65.7 | -1 | 2.25 | -39.5 | 33.6 | 0.294 | 3.30 | 21.23 | 7628 | 0.028 | 24687 |
| PLAISANCE | | -20.43 | 57.67 | 0.331 | -53.4 | -14 | 1.38 | 36.3 | 53.5 | 0.422 | 6.55 | 53.99 | 2612 | 0.118 | 9739 |
| POSADAS | | -27.42 | -56.10 | 0.218 | -24.4 | -4 | 1.18 | 1.4 | -59.5 | 0.282 | -16.23 | -57.27 | 684 | 0.192 | 3634 |
| PONZA | | 40.92 | 12.95 | 0.390 | 56.1 | -2 | 1.59 | -25.8 | 23.9 | 0.288 | 4.79 | 17.30 | 3631 | 0.077 | 12967 |
| PONTA DELGADO | | 37.77 | -25.65 | 0.387 | 57.6 | -16 | 1.83 | -38.7 | -1.8 | 0.258 | -3.04 | -14.61 | 4761 | 0.053 | 16721 |
| POTCHEFSTROOM | | -26.68 | 27.08 | 0.290 | -61.9 | -17 | 1.63 | 41.9 | 16.5 | 0.395 | 4.89 | 20.44 | 3873 | 0.072 | 13676 |
| POINT BARROW | | 71.33 | -156.77 | 0.502 | 80.3 | 28 | 8.46 | -59.0 | 156.1 | 0.575 | 5.23 | 176.97 | 48060 | 0.001 | 5082 |
| POTSDAM | | 52.38 | 13.07 | 0.423 | 67.2 | -1 | 2.45 | -42.5 | 54.8 | 0.299 | 2.75 | 20.73 | 8874 | 0.022 | 28280 |
| POITIERS | | 46.57 | 0.35 | 0.404 | 62.6 | -7 | 2.05 | -37.5 | 20.8 | 0.280 | 1.84 | 8.84 | 6268 | 0.037 | 20871 |
| PORT ARTHUR | | 30.00 | -94.00 | 0.448 | 60.5 | 7 | 1.81 | -49.7 | -111.3 | 0.411 | -10.50 | -99.09 | 5219 | 0.051 | 17871 |
| POONA | | 18.05 | 73.12 | 0.360 | 21.5 | -1 | 1.01 | -0.4 | 74.4 | 0.338 | 7.82 | 73.68 | 511 | 0.302 | 2252 |
| PORO POINT | | 16.62 | 120.28 | 0.352 | 18.9 | 0 | 1.00 | -0.5 | 119.9 | 0.354 | 8.22 | 120.17 | 471 | 0.314 | 2069 |
| PORT AUX FRANCAIS | | -49.35 | 70.27 | 0.418 | -69.0 | -46 | 3.84 | 63.2 | 45.6 | 0.472 | 6.28 | 51.59 | 18056 | 0.006 | 63630 |
| PORT STANLEY | | -51.70 | -57.85 | 0.294 | -48.5 | 7 | 1.66 | 23.6 | -63.0 | 0.402 | -14.11 | -58.36 | 3630 | 0.068 | 14261 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** GEOGRAPHIC | | | | | ** CONJUGATE | | | ** MINIMUM-B EQUATOR | | | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| PORT MORESBY | -9.20 | 147.15 | 0.372 | -32.9 | 6 | 1.10 | 25.1 | 149.3 | 0.335 | 8.96 | 148.66 | 961 | 0.233 | 4527 |
| PROVIDENIE BAY | 64.38 | 186.60 | 0.479 | 74.0 | 13 | 4.16 | -50.2 | 187.7 | 0.557 | 6.16 | 171.64 | 20458 | 0.004 | 60001 |
| PRAHA | 50.07 | 14.43 | 0.418 | 65.3 | -1 | 2.21 | -38.8 | 33.0 | 0.293 | 3.47 | 20.95 | 7377 | 0.030 | 23964 |
| PRUHONICE | 49.98 | 14.55 | 0.418 | 65.2 | -1 | 2.20 | -38.7 | 33.0 | 0.293 | 3.45 | 21.02 | 7322 | 0.030 | 23803 |
| PRETORIA | -26.80 | 28.20 | 0.291 | -61.9 | -17 | 1.63 | 42.1 | 17.9 | 0.397 | 4.82 | 21.65 | 3914 | 0.071 | 13797 |
| PRINCE ALBERT | 53.20 | -105.70 | 0.525 | 78.0 | 17 | 4.92 | -65.4 | -149.3 | 0.537 | -7.66 | -118.52 | 25152 | 0.003 | 73329 |
| PULLMANN | 46.72 | -117.17 | 0.496 | 71.0 | 19 | 2.95 | -55.2 | -149.7 | 0.538 | -5.22 | -129.65 | 12589 | 0.012 | 38433 |
| PUNTA ARENAS | -53.15 | -70.90 | 0.326 | -51.0 | 16 | 1.71 | 24.6 | -69.1 | 0.416 | -14.05 | -66.75 | 4248 | 0.062 | 15404 |
| PYONGYANG | 39.07 | 125.78 | 0.445 | 55.1 | -5 | 1.39 | -21.6 | 125.3 | 0.457 | 9.26 | 126.39 | 2942 | 0.116 | 10769 |
| QUETTA | 30.18 | 66.95 | 0.411 | 45.0 | 1 | 1.19 | -13.5 | 70.2 | 0.353 | 7.20 | 67.71 | 1595 | 0.182 | 6488 |
| QUEEN MAUD LAND | -70.50 | -1.00 | 0.388 | -64.1 | -19 | 4.25 | 52.9 | -42.6 | 0.459 | -7.85 | -26.14 | 20214 | 0.004 | 60656 |
| QUENTONCITY | 19.00 | 121.00 | 0.359 | 23.8 | 0 | 1.01 | -2.9 | 120.5 | 0.361 | 8.24 | 120.91 | 580 | 0.298 | 2697 |
| QUEBEC | 46.92 | -71.08 | 0.500 | 75.3 | -16 | 4.07 | -74.6 | -79.8 | 0.463 | -12.37 | -66.27 | 19334 | 0.005 | 57853 |
| QUILON | 8.50 | 76.00 | 0.339 | -1.4 | -3 | 0.97 | 9.6 | 75.9 | 0.340 | NO MINIMUM B BETWEEN INTERS. | | | | 133 |
| RABAT | 34.02 | -6.85 | 0.360 | 49.4 | -9 | 1.42 | -22.3 | 6.9 | 0.273 | 2.81 | -0.31 | 2516 | 0.107 | 9687 |
| RAMEY AFB | 18.50 | -67.20 | 0.381 | 51.1 | -6 | 1.49 | -45.9 | -67.0 | 0.286 | -14.67 | -64.92 | 2795 | 0.094 | 11063 |
| RAROTONGA | -21.20 | -159.75 | 0.363 | -38.2 | 13 | 1.18 | 19.8 | -161.4 | 0.320 | 0.15 | -155.21 | 1296 | 0.189 | 5829 |
| RESOLUTE | 74.68 | -94.92 | 0.514 | 89.2 | -47 | 97.70 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| REYKJAVIK | 64.18 | -21.70 | 0.454 | 76.1 | -24 | 6.63 | -69.2 | 69.2 | 0.417 | -3.24 | 0.34 | 35437 | 0.001 | 102769 |
| REGENSBERG | 47.48 | 8.45 | 0.408 | 63.1 | -3 | 2.04 | -36.4 | 26.5 | 0.265 | 3.06 | 15.42 | 6271 | 0.038 | 20807 |
| RIO DE JANEIRO | -22.90 | -43.22 | 0.215 | -24.6 | -14 | 1.17 | 3.7 | -49.9 | 0.279 | -13.38 | -45.78 | 644 | 0.194 | 3416 |
| RIO GALLEGOS | -51.63 | -69.22 | 0.314 | -49.5 | 15 | 1.65 | 23.1 | -68.3 | 0.407 | -14.25 | -65.85 | 3825 | 0.069 | 14167 |
| ROYAL ROADS | 48.50 | -123.50 | 0.492 | 70.9 | 22 | 3.00 | -54.0 | -156.7 | 0.514 | -3.53 | -137.13 | 12948 | 0.011 | 39411 |
| ROMA | 41.88 | 12.50 | 0.393 | 57.2 | -2 | 1.54 | -27.2 | 24.3 | 0.288 | 4.53 | 17.15 | 3933 | 0.070 | 13877 |
| ROSTOV/DON | 47.23 | 39.65 | 0.437 | 64.1 | 6 | 1.90 | -32.6 | 49.9 | 0.321 | 5.99 | 41.60 | 5690 | 0.046 | 18890 |
| SANTA CRUZ | -17.80 | -63.17 | 0.227 | -7.9 | -1 | 1.11 | -9.2 | -63.6 | 0.245 | -17.14 | -63.19 | 310 | 0.227 | 1011 |
| SAN FERNANDO | 36.47 | -6.20 | 0.369 | 52.4 | -9 | 1.51 | -25.3 | 8.9 | 0.274 | 2.45 | 0.84 | 3043 | 0.089 | 11334 |
| SANTA CRUZ | 28.33 | -16.25 | 0.340 | 43.8 | -12 | 1.33 | -20.1 | -2.6 | 0.260 | 1.13 | -9.43 | 1853 | 0.132 | 7650 |
| SANTIAGO | -33.57 | -70.72 | 0.247 | -32.5 | 9 | 1.22 | 6.1 | -69.6 | 0.315 | -15.80 | -69.27 | 1099 | 0.171 | 5332 |
| SALEKHARD | 66.58 | 66.67 | 0.497 | 79.6 | 17 | 4.51 | -49.5 | 67.1 | 0.482 | 8.64 | 71.24 | 22546 | 0.003 | 65760 |
| SASKATOON | 52.13 | -106.67 | 0.522 | 77.1 | 18 | 4.53 | -64.2 | -148.3 | 0.533 | -7.37 | -119.34 | 22648 | 0.003 | 66388 |
| SAPPORO | 43.02 | 121.35 | 0.470 | 60.3 | -6 | 1.54 | -25.1 | 121.4 | 0.477 | 9.35 | 122.13 | 3915 | 0.085 | 13563 |
| SACRAMENTO PEAK | 32.72 | -105.75 | 0.450 | 60.8 | 12 | 1.84 | -47.4 | -125.5 | 0.433 | -8.12 | -112.91 | 5454 | 0.049 | 18483 |
| SAN JUAN | 18.43 | -66.00 | 0.379 | 50.9 | -6 | 1.49 | -46.8 | -64.6 | 0.281 | -14.81 | -63.29 | 2765 | 0.094 | 10989 |
| SAN JULIAN | -49.32 | -67.78 | 0.299 | -47.4 | 13 | 1.56 | 20.8 | -67.6 | 0.394 | -14.47 | -65.19 | 3276 | 0.081 | 12531 |
| SAO PAULO | -23.55 | -46.63 | 0.214 | -23.3 | -12 | 1.17 | 2.1 | -52.4 | 0.275 | -14.40 | -48.75 | 610 | 0.196 | 3258 |
| SAO JOSE DOS CAMPO | -23.00 | -46.00 | 0.214 | -22.9 | -12 | 1.17 | 2.1 | -51.8 | 0.274 | -14.34 | -48.09 | 593 | 0.197 | 3176 |
| SALISBURY RHODE-NYA | -17.83 | 31.00 | 0.296 | -53.9 | -9 | 1.36 | 35.7 | 26.3 | 0.382 | 6.48 | 27.79 | 2289 | 0.124 | 8799 |
| SCHWARZENBURG | 46.83 | 7.33 | 0.406 | 62.5 | -4 | 2.00 | -35.7 | 25.2 | 0.284 | 2.76 | 14.39 | 6010 | 0.040 | 20060 |
| SCOTT BASE | -77.85 | 166.75 | 0.565 | -83.3 | -58 | 35.64 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| SENDAI | 38.10 | 140.55 | 0.409 | 51.7 | -5 | 1.36 | -21.0 | 138.4 | 0.447 | 9.21 | 140.56 | 2656 | 0.125 | 10051 |
| SEOUL | 37.58 | 127.05 | 0.435 | 53.1 | -5 | 1.34 | -20.3 | 126.4 | 0.449 | 9.04 | 127.59 | 2638 | 0.128 | 9875 |
| SEATTLE | 47.75 | -122.42 | 0.492 | 70.6 | 21 | 2.93 | -53.8 | -155.0 | 0.511 | -3.96 | -135.70 | 12481 | 0.012 | 38116 |
| SEMIPALATINSK | 50.40 | 80.25 | 0.500 | 69.5 | 5 | 2.03 | -32.7 | 87.9 | 0.454 | 8.85 | 81.45 | 6967 | 0.037 | 22151 |
| SEAGROVE | -37.08 | 174.78 | 0.484 | -63.0 | 17 | 1.93 | 46.1 | -166.1 | 0.438 | 4.52 | -175.31 | 6088 | 0.044 | 20228 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** D | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| SHEPHERD BAY | 68.75 | -93.75 | 0.522 | 87.5 | -8 | 29.69 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| SHIRAZ | 29.63 | 52.52 | 0.392 | 44.0 | 2 | 1.20 | -13.6 | 54.7 | 0.317 | 6.44 | 52.78 | 1538 | 0.177 | 6350 |
| SHACKLETON | -77.98 | -37.17 | 0.445 | -67.3 | 5 | 4.95 | 51.8 | -58.9 | 0.487 | -10.98 | -47.00 | 24799 | 0.003 | 73274 |
| SHEFFIELD | 53.43 | 1.35 | 0.422 | 68.2 | -7 | 2.74 | -47.5 | 29.3 | 0.300 | 1.09 | 12.09 | 10556 | 0.016 | 33191 |
| SIMOSATO | 33.58 | 135.94 | 0.397 | 46.7 | -4 | 1.24 | -16.8 | 134.7 | 0.424 | 8.98 | 136.15 | 1926 | 0.164 | 7768 |
| SIDMOUTH | 50.68 | 3.22 | 0.415 | 66.9 | -6 | 2.39 | -42.7 | 26.9 | 0.289 | 1.75 | 12.44 | 8382 | 0.024 | 26961 |
| SITKA | 57.05 | -135.33 | 0.497 | 74.3 | 27 | 4.10 | -55.7 | -175.0 | 0.542 | -0.23 | -153.29 | 19993 | 0.004 | 58675 |
| SIMFEROPOL | 44.83 | 34.07 | 0.423 | 61.3 | 4 | 1.76 | -29.7 | 43.0 | 0.306 | 5.78 | 36.09 | 4754 | 0.058 | 16198 |
| SINGAPORE | 1.32 | 103.82 | 0.357 | -18.2 | 1 | 0.99 | 17.2 | 104.0 | 0.365 | 8.86 | 103.93 | 452 | 0.325 | 1904 |
| SLOUGH | 51.48 | -0.57 | 0.417 | 66.8 | -8 | 2.53 | -45.3 | 25.7 | 0.291 | 0.88 | 9.86 | 9249 | 0.020 | 29488 |
| SODANKYLA | 67.37 | 26.65 | 0.460 | 77.0 | 5 | 5.31 | -56.8 | 55.3 | 0.422 | 4.51 | 39.01 | 27263 | 0.002 | 79473 |
| SOUTH POLE | -90.00 | 0. | 0.518 | -75.7 | -28 | 15.25 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| SREDNIKAN | 62.43 | 152.32 | 0.486 | 73.3 | -6 | 3.23 | -43.7 | 141.0 | 0.553 | 9.04 | 147.46 | 14575 | 0.009 | 43565 |
| ST. STEPHEN | 67.20 | -45.20 | 0.481 | 80.0 | -41 | 13.90 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| STELLENBOSCH | -33.94 | 18.85 | 0.279 | -64.2 | -25 | 1.87 | 44.3 | 0.6 | 0.397 | 2.10 | 8.36 | 5243 | 0.048 | 17866 |
| STOCKHOLM | 59.30 | 18.10 | 0.440 | 72.2 | 0 | 3.37 | -50.5 | 47.5 | 0.345 | 3.21 | 27.54 | 14737 | 0.008 | 44781 |
| STONYHURST | 53.51 | -2.47 | 0.422 | 68.4 | -9 | 2.82 | -49.0 | 27.4 | 0.301 | 0.35 | 9.22 | 11049 | 0.014 | 34534 |
| ST. LAWRENCE | 50.58 | 1.23 | 0.415 | 66.0 | -7 | 2.41 | -43.3 | 25.6 | 0.288 | 1.48 | 10.87 | 8474 | 0.023 | 27246 |
| STANLEY | -51.70 | -57.85 | 0.294 | -48.5 | 7 | 1.66 | 23.6 | -53.0 | 0.402 | -14.11 | -58.36 | 3830 | 0.068 | 14261 |
| ST. SANTIN-DE-MAUR | 44.60 | 20.20 | 0.407 | 60.2 | 0 | 1.77 | -30.1 | 31.8 | 0.292 | 4.81 | 24.10 | 4726 | 0.057 | 16191 |
| ST. MICHEL | 43.92 | 5.72 | 0.397 | 59.7 | -4 | 1.80 | -31.7 | 21.6 | 0.282 | 3.05 | 12.28 | 4847 | 0.054 | 16652 |
| STANFORD | 37.43 | -122.17 | 0.448 | 61.9 | 16 | 1.94 | -45.3 | -144.5 | 0.459 | -4.36 | -131.53 | 6107 | 0.042 | 20300 |
| ST. JOHNS | 47.52 | -52.78 | 0.467 | 71.9 | -25 | 3.63 | -71.3 | -25.6 | 0.393 | -10.26 | -40.00 | 16287 | 0.007 | 49673 |
| SUKKERTOPPEN | 65.42 | -52.90 | 0.489 | 80.5 | -42 | 13.76 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| SULPHUR MOUNTAIN | 51.10 | -115.60 | 0.511 | 74.6 | 21 | 3.79 | -59.4 | -154.0 | 0.528 | -5.14 | -129.66 | 17943 | 0.006 | 53289 |
| SURLARI | 44.68 | 26.25 | 0.413 | 60.6 | 2 | 1.76 | -29.7 | 36.4 | 0.297 | 5.23 | 29.22 | 4702 | 0.058 | 16090 |
| SVERDLOVSK | 56.73 | 61.07 | 0.486 | 73.5 | 11 | 2.71 | -40.9 | 75.6 | 0.423 | 7.60 | 63.45 | 11051 | 0.016 | 33646 |
| SWANSEA | 51.63 | -4.00 | 0.418 | 67.1 | -9 | 2.61 | -46.9 | 24.1 | 0.292 | 0.23 | 7.29 | 9712 | 0.018 | 30848 |
| SWAKTHMORE | 39.90 | -75.35 | 0.488 | 71.1 | -8 | 2.88 | -67.1 | -37.5 | 0.438 | -12.92 | -73.72 | 11830 | 0.013 | 36831 |
| SYDNEY | -33.60 | 151.10 | 0.504 | -64.2 | 11 | 1.94 | 50.3 | 150.9 | 0.430 | 8.27 | 157.24 | 6239 | 0.044 | 20552 |
| SYKTYVKAR | 61.70 | 50.80 | 0.476 | 75.7 | 13 | 3.51 | -47.1 | 72.2 | 0.421 | 6.81 | 55.48 | 15997 | 0.007 | 47816 |
| SYOWA BASE | -69.03 | 39.60 | 0.416 | -67.7 | -43 | 6.61 | 54.3 | -21.1 | 0.453 | -2.95 | 0.87 | 35296 | 0.001 | 102370 |
| TAMALE | 9.42 | -0.89 | 0.273 | 2.7 | -11 | 1.05 | 7.0 | -0.4 | 0.269 | NO MINIMUM B BETWEEN INTERS. | | | 283 | |
| TASHKENT | 41.42 | 69.20 | 0.462 | 60.2 | 3 | 1.54 | -24.6 | 75.1 | 0.392 | 7.69 | 70.09 | 3768 | 0.084 | 13079 |
| TAMANRASSET | 22.80 | 5.52 | 0.315 | 28.8 | -6 | 1.11 | -4.3 | 10.1 | 0.275 | 7.20 | 7.89 | 754 | 0.222 | 3513 |
| TAIPEI | 25.03 | 121.52 | 0.383 | 35.1 | -1 | 1.08 | -8.6 | 121.0 | 0.386 | 8.51 | 121.56 | 990 | 0.247 | 4476 |
| TALARA | -4.57 | -81.25 | 0.271 | 13.3 | 6 | 1.09 | -18.1 | -83.0 | 0.250 | -13.55 | -82.30 | 384 | 0.242 | 1617 |
| TANANARIVE | -18.92 | 47.55 | 0.310 | -52.5 | -10 | 1.35 | 35.3 | 44.3 | 0.404 | 6.38 | 44.63 | 2356 | 0.126 | 8930 |
| TAHITI | -17.48 | -149.48 | 0.330 | -29.4 | 12 | 1.11 | 13.0 | -143.7 | 0.304 | -1.47 | -146.28 | 818 | 0.228 | 3976 |
| TBILISI | 41.72 | 44.82 | 0.428 | 59.1 | 5 | 1.59 | -26.1 | 51.1 | 0.320 | 6.25 | 45.68 | 3838 | 0.077 | 13451 |
| TENIENTE MATIENZO | -64.97 | -60.05 | 0.378 | -58.8 | 15 | 2.47 | 36.7 | -64.5 | 0.461 | -12.72 | -58.37 | 9055 | 0.020 | 29258 |
| TEHRAN | 35.68 | 51.42 | 0.416 | 52.5 | 4 | 1.36 | -19.8 | 55.2 | 0.325 | 6.56 | 51.81 | 2482 | 0.123 | 9350 |
| TENERIFE | 28.00 | -17.00 | 0.339 | 43.6 | -12 | 1.32 | -20.1 | -3.3 | 0.259 | 0.83 | -10.10 | 1330 | 0.133 | 7586 |
| TEOLOYUCAN | 19.75 | -99.18 | 0.383 | 47.1 | 9 | 1.35 | -36.4 | -110.4 | 0.347 | -9.21 | -103.53 | 2276 | 0.124 | 9137 |
| THULE | 76.55 | -68.83 | 0.500 | 85.9 | -72 | 190.56 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| THE PAS | 53.80 | -101.30 | 0.527 | 79.2 | 14 | 5.44 | -57.9 | -146.4 | 0.538 | -8.43 | -112.76 | 28410 | 0.002 | 82404 |

Table 3

Tracings 300 Km Above Stations

| STATIONS | ** | O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| FIHANY | | 46.89 | 17.89 | 0.412 | 62.5 | 0 | 1.93 | -33.6 | 32.1 | 0.291 | 4.12 | 22.80 | 5685 | 0.044 | 19028 |
| FIXIE BAY | | 71.55 | 178.90 | 0.512 | 81.9 | -8 | 5.70 | -50.8 | 124.5 | 0.567 | 10.51 | 125.25 | 30360 | 0.002 | 87033 |
| FIRUCHIRAPALLI | | 10.83 | 78.83 | 0.344 | 3.7 | -2 | 0.97 | 7.8 | 79.0 | 0.341 | 8.45 | 78.98 | 304 | 0.341 | 353 |
| FORINO | | 45.20 | 7.65 | 0.401 | 60.9 | -4 | 1.88 | -33.1 | 23.9 | 0.284 | 3.29 | 14.12 | 5281 | 0.048 | 17913 |
| FOTTORI | | 35.53 | 134.22 | 0.410 | 49.5 | -5 | 1.29 | -18.6 | 153.0 | 0.436 | 9.03 | 134.54 | 2236 | 0.147 | 8719 |
| FORUN | | 53.08 | 18.55 | 0.428 | 67.9 | 0 | 2.48 | -42.3 | 39.2 | 0.307 | 3.58 | 25.26 | 9097 | 0.021 | 28859 |
| FOMSK | | 56.47 | 84.93 | 0.513 | 74.7 | 6 | 2.59 | -38.4 | 93.9 | 0.485 | 9.43 | 86.48 | 10540 | 0.018 | 32151 |
| FORRE CHIARUCCIA | | 42.03 | 11.83 | 0.393 | 57.4 | -2 | 1.65 | -27.5 | 24.0 | 0.287 | 4.23 | 16.68 | 3994 | 0.069 | 14069 |
| FORTOSA | | 40.82 | 0.50 | 0.385 | 56.7 | -7 | 1.66 | -28.8 | 16.0 | 0.279 | 2.98 | 7.29 | 3982 | 0.068 | 14110 |
| FOLEDO | | 39.88 | -4.05 | 0.382 | 56.1 | -8 | 1.65 | -29.2 | 12.6 | 0.276 | 2.09 | 3.48 | 3895 | 0.069 | 13893 |
| FOYOKAWA | | 35.83 | 137.37 | 0.405 | 49.4 | -5 | 1.29 | -18.9 | 155.8 | 0.436 | 9.08 | 137.56 | 2269 | 0.144 | 8847 |
| FONANZINTLA | | 19.03 | -98.30 | 0.380 | 46.4 | 9 | 1.34 | -35.9 | -109.1 | 0.342 | -9.52 | -102.53 | 2177 | 0.128 | 8828 |
| FOWNSVILLE | | -19.10 | 146.50 | 0.429 | -48.1 | 7 | 1.35 | 35.6 | 150.1 | 0.377 | 8.87 | 149.24 | 2203 | 0.144 | 8748 |
| FRUJILLO | | -8.10 | -79.03 | 0.260 | 7.4 | 5 | 1.08 | -15.6 | -79.9 | 0.247 | -14.23 | -79.70 | 317 | 0.246 | 681 |
| FROMSO | | 69.67 | 18.95 | 0.460 | 77.9 | 0 | 6.57 | -60.4 | 66.2 | 0.436 | 3.64 | 35.39 | 35316 | 0.001 | 101869 |
| FRELEW | | -43.20 | -65.30 | 0.267 | -41.7 | 9 | 1.40 | 14.9 | -66.3 | 0.361 | -15.05 | -64.14 | 2167 | 0.115 | 9089 |
| FRIVANDRUM | | 8.42 | 76.95 | 0.340 | -1.8 | -3 | 0.97 | 9.9 | 76.9 | 0.341 | NO MINIMUM B BETWEEN INTERS. | | | | 171 |
| FRINIDAD | | 10.60 | -61.20 | 0.330 | 40.2 | -8 | 1.31 | -37.6 | -56.5 | 0.235 | -15.27 | -58.02 | 1504 | 0.142 | 6901 |
| FSCHOIBALSAN | | 48.07 | 114.50 | 0.498 | 66.3 | -5 | 1.80 | -29.6 | 115.7 | 0.497 | 9.71 | 115.47 | 5614 | 0.052 | 18343 |
| FSUMEB | | -19.23 | 17.72 | 0.286 | -55.0 | -15 | 1.39 | 35.5 | 8.5 | 0.368 | 5.20 | 12.60 | 2394 | 0.115 | 9200 |
| FUBINGEN | | 48.53 | 9.07 | 0.411 | 64.0 | -3 | 2.12 | -37.8 | 28.0 | 0.287 | 2.72 | 16.28 | 6771 | 0.034 | 22260 |
| FUCSON | | 32.23 | -110.95 | 0.440 | 59.1 | 13 | 1.75 | -44.8 | -130.0 | 0.430 | -7.08 | -118.39 | 4922 | 0.057 | 16948 |
| FUCSON | | 32.23 | -110.95 | 0.440 | 59.1 | 13 | 1.75 | -44.8 | -130.0 | 0.430 | -7.08 | -118.39 | 4922 | 0.057 | 16948 |
| FUCUMAN | | -26.90 | -65.40 | 0.228 | -22.8 | 2 | 1.16 | -3.5 | -65.9 | 0.280 | -16.61 | -65.28 | 622 | 0.202 | 3276 |
| UJI | | 34.90 | 135.78 | 0.404 | 48.5 | -4 | 1.27 | -18.0 | 134.5 | 0.432 | 9.01 | 136.02 | 2127 | 0.152 | 8394 |
| ULAN BATOR | | 47.78 | 1 6.75 | 0.502 | 66.6 | -3 | 1.79 | -29.3 | 109.1 | 0.490 | 9.62 | 107.75 | 5575 | 0.053 | 18189 |
| UNALASKA | | 53.88 | -166.53 | 0.443 | 66.6 | 15 | 2.54 | -43.2 | 169.7 | 0.518 | 4.85 | -178.18 | 10069 | 0.019 | 31345 |
| UNIVERSITY PARK | | 40.80 | -77.77 | 0.493 | 71.8 | -6 | 3.00 | -57.3 | -93.4 | 0.450 | -12.74 | -77.22 | 12579 | 0.011 | 38872 |
| UPPSALA | | 59.80 | 17.60 | 0.441 | 72.5 | 0 | 3.47 | -51.2 | 47.9 | 0.349 | 2.95 | 27.44 | 15375 | 0.008 | 46575 |
| USHUAIA | | -54.80 | -68.30 | 0.330 | -51.9 | 15 | 1.78 | 26.2 | -67.9 | 0.422 | -13.87 | -64.78 | 4683 | 0.055 | 16701 |
| UTSJOKI | | 69.75 | 27.03 | 0.464 | 78.2 | 5 | 6.29 | -58.7 | 69.7 | 0.442 | 4.53 | 41.31 | 33603 | 0.001 | 97005 |
| VALENTIA | | 51.94 | -10.25 | 0.420 | 67.8 | -12 | 2.77 | -50.1 | 21.1 | 0.296 | -0.76 | 2.54 | 10751 | 0.015 | 33869 |
| VERKHOYANSK | | 67.60 | 133.40 | 0.510 | 79.1 | -10 | 4.35 | -47.4 | 128.0 | 0.564 | 10.26 | 130.45 | 21796 | 0.004 | 63387 |
| VAL D'OR | | 48.00 | -77.80 | 0.511 | 76.6 | -10 | 4.38 | -73.9 | -99.6 | 0.486 | -12.18 | -76.59 | 21371 | 0.004 | 63356 |
| VICTORIA | | 48.40 | -123.40 | 0.492 | 70.9 | 22 | 2.99 | -54.0 | -156.5 | 0.513 | -3.58 | -136.99 | 12876 | 0.011 | 39210 |
| VLADIVOSTOK | | 43.78 | 132.03 | 0.454 | 59.5 | -7 | 1.56 | -26.0 | 133.7 | 0.480 | 9.34 | 132.54 | 4029 | 0.081 | 13989 |
| VOSTOK | | -76.48 | 106.50 | 0.542 | -80.1 | 71 | 121.37 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| WATHEROO | | -30.32 | 115.88 | 0.500 | -64.8 | -2 | 1.85 | 48.8 | 114.6 | 0.500 | 9.90 | 115.57 | 5898 | 0.049 | 19146 |
| WAKKANAI | | 45.40 | 141.68 | 0.441 | 59.6 | -7 | 1.63 | -27.7 | 138.4 | 0.486 | 9.15 | 141.44 | 4412 | 0.072 | 15180 |
| WASHINGTON | | 38.73 | -77.13 | 0.486 | 70.3 | -5 | 2.73 | -65.5 | -90.8 | 0.437 | -12.89 | -76.48 | 10903 | 0.015 | 34195 |
| WALTAIR | | 17.57 | -3.30 | 0.364 | 18.8 | -1 | 0.99 | 1.6 | 64.1 | 0.349 | 8.81 | 83.67 | 458 | 0.319 | 1928 |
| WELLEN | | 66.17 | -159.84 | 0.486 | 75.6 | 16 | 4.82 | -52.4 | 197.6 | 0.562 | 6.03 | 172.97 | 24699 | 0.003 | 71706 |
| WESTFORD | | 42.58 | -71.42 | 0.491 | 72.6 | -13 | 3.26 | -70.5 | -78.9 | 0.441 | -12.78 | -67.47 | 14141 | 0.009 | 43379 |
| WEISSENAU | | 47.80 | 9.50 | 0.409 | 63.3 | -3 | 2.06 | -36.6 | 27.5 | 0.286 | 2.94 | 16.38 | 6380 | 0.037 | 21119 |
| WELLINGTON | | -41.28 | 174.77 | 0.503 | -66.7 | 19 | 2.26 | 50.1 | -162.5 | 0.431 | 4.10 | -173.58 | 8181 | 0.028 | 26103 |

## Table 3

### Tracings 300 Km Above Stations

| STATIONS | ** | O | R | I | G | I | N | ** CONJUGATE | | INTERS. ** | MINIMUM-B | | EQUATOR | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| WHITE SANDS | | 32.40 | -106.87 | 0.447 | 60.2 | 12 | 1.81 | -46.6 | -126.3 | 0.431 | -7.82 | -114.04 | 5253 | 0.052 | 17907 |
| WINGST | | 53.75 | 9.07 | 0.424 | 68.3 | -3 | 2.66 | -45.5 | 34.1 | 0.333 | 2.10 | 18.15 | 10131 | 0.017 | 31903 |
| WITTEVEEN | | 52.82 | 6.67 | 0.421 | 67.6 | -4 | 2.58 | -44.8 | 31.5 | 0.298 | 1.85 | 15.94 | 9603 | 0.019 | 30424 |
| WIESE ISLAND | | 79.83 | 76.98 | 0.497 | 85.1 | 24 | 12.22 | ** NO | COMPUTATIONS | | PERFORMED | | | ** | |
| WINNIPEG | | 49.90 | -97.40 | 0.523 | 77.1 | 9 | 4.38 | -56.9 | -135.6 | 0.522 | -9.40 | -106.21 | 21647 | 0.004 | 53732 |
| WIEN KOBENZL | | 48.27 | 16.32 | 0.414 | 63.7 | -0 | 2.05 | -35.9 | 32.4 | 0.292 | 3.74 | 21.93 | 6364 | 0.037 | 21619 |
| WILKES | | -66.20 | 110.35 | 0.554 | -82.3 | -31 | 36.40 | ** NO | COMPUTATIONS | | PERFORMED | | | ** | |
| WOOMERA | | -30.70 | 136.80 | 0.503 | -63.1 | 6 | 1.81 | 48.8 | 140.3 | 0.458 | 9.33 | 139.98 | 5569 | 0.052 | 18447 |
| WROCLAW | | 51.10 | 17.08 | 0.422 | 66.2 | 0 | 2.29 | -39.8 | 35.9 | 0.298 | 3.42 | 23.43 | 7875 | 0.027 | 25375 |
| WRANGEL ISLAND | | 71.00 | -178.50 | 0.496 | 78.8 | 13 | 6.43 | -54.7 | 148.9 | 0.573 | 7.31 | 162.93 | 34992 | 0.001 | 100629 |
| YAKUTSK | | 62.05 | 129.67 | 0.509 | 75.9 | -11 | 3.18 | -42.4 | 127.0 | 0.551 | 10.33 | 128.83 | 14333 | 0.010 | 42733 |
| YAMAGAWA | | 31.20 | 130.65 | 0.397 | 44.1 | -3 | 1.19 | -14.6 | 129.9 | 0.414 | 8.82 | 130.92 | 1626 | 0.186 | 6767 |
| YELLOWKNIFE | | 62.40 | -114.40 | 0.525 | 82.0 | 30 | 8.69 | -67.3 | -173.0 | 0.563 | -4.52 | -135.00 | 49281 | 0.000 | 139893 |
| YUZHNO-SAKHALINSK | | 46.95 | 142.72 | 0.446 | 61.0 | -7 | 1.71 | -29.1 | 139.0 | 0.493 | 9.30 | 142.29 | 4898 | 0.063 | 16574 |
| ZARIA | | 11.15 | 7.65 | 0.282 | 3.2 | -8 | 1.04 | 8.4 | 8.1 | 0.277 | NO MINIMUM B BETWEEN INTERS. | | | | 322 |
| ZUGSPITZE | | 47.42 | 10.98 | 0.409 | 63.0 | -2 | 2.02 | -35.7 | 29.0 | 0.287 | 3.31 | 17.41 | 6136 | 0.039 | 20393 |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** | O | R | I | G | I | N | ** CONJUGATE | INTERS. ** | MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| ABASHIRI | | 43.97 | 140.33 | 0.417 | 58.3 | -6 | 1.59 | -26.3 | 137.4 | 0.456 | 9.21 | 140.17 | 4154 | 0.077 | 14193. |
| ABISKO | | 68.35 | 18.82 | 0.440 | 77.2 | 0 | 6.03 | -59.3 | 63.4 | 0.408 | 3.50 | 34.25 | 31863 | 0.001 | 92115. |
| ABERYSTWYTH | | 52.40 | -4.07 | 0.403 | 67.6 | -10 | 2.75 | -48.2 | 25.1 | 0.287 | 0.29 | 7.57 | 10609 | 0.016 | 33181. |
| ACCRA | | 5.63 | -0.20 | 0.255 | -5.5 | -11 | 1.07 | 10.4 | -1.2 | 0.262 | 6.12 | -0.31 | 405 | 0.254 | 576. |
| ADEN | | 12.77 | 44.97 | 0.300 | 9.8 | 0 | 1.03 | 4.4 | 45.0 | 0.286 | 6.79 | 44.99 | 436 | 0.283 | 1003. |
| ADDIS ABABA | | 9.03 | 38.77 | 0.287 | -0.6 | 0 | 1.03 | 9.5 | 38.8 | 0.288 | NO MINIMUM B BETWEEN | | INTERS. | | 59. |
| ADELAIDE | | -34.95 | 138.53 | 0.497 | -67.1 | 7 | 2.16 | 53.3 | 144.0 | 0.448 | 9.33 | 142.63 | 7767 | 0.031 | 24420. |
| ADAK | | 51.90 | -176.65 | 0.410 | 64.0 | 10 | 2.25 | -39.0 | 164.7 | 0.485 | 6.18 | 174.50 | 8175 | 0.028 | 25829. |
| AGINCOURT | | 43.80 | -79.30 | 0.480 | 73.8 | -6 | 3.50 | -69.5 | -98.5 | 0.447 | -12.47 | -79.30 | 15831 | 0.007 | 47700. |
| AHMEDABAD | | 23.02 | 72.60 | 0.362 | 31.8 | -0 | 1.08 | -5.5 | 74.6 | 0.330 | 7.80 | 73.31 | 928 | 0.248 | 3763. |
| AIRE-SUR-ADOUR | | 43.70 | -0.30 | 0.378 | 59.8 | -7 | 1.88 | -33.7 | 18.0 | 0.268 | 2.20 | 7.52 | 5247 | 0.048 | 17653. |
| AKROTIRI | | 34.58 | 32.95 | 0.367 | 48.7 | 2 | 1.34 | -17.1 | 36.5 | 0.286 | 6.59 | 33.78 | 2256 | 0.127 | 8423. |
| AKLAVIK | | 68.23 | -135.00 | 0.490 | 81.2 | 36 | 9.60 | -63.0 | 168.0 | 0.546 | 0.88 | -162.55 | 55231 | 0.000 | 155885. |
| AKITA | | 39.73 | 140.13 | 0.399 | 53.7 | -5 | 1.43 | -22.4 | 137.8 | 0.435 | 9.12 | 140.07 | 3118 | 0.107 | 11171. |
| ALMERIA | | 36.85 | -2.47 | 0.354 | 52.3 | -8 | 1.53 | -24.7 | 11.5 | 0.266 | 2.87 | 4.02 | 3153 | 0.087 | 11386. |
| ALDAN | | 58.60 | 125.50 | 0.485 | 73.8 | -9 | 2.73 | -39.2 | 124.4 | 0.515 | 10.16 | 125.52 | 11481 | 0.015 | 34592. |
| ALERT | | 82.55 | -63.58 | 0.476 | 86.4 | -84 | 252.38 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | ** | | | |
| ALMA-ATA | | 43.20 | 76.92 | 0.453 | 62.0 | 3 | 1.62 | -25.7 | 82.7 | 0.401 | 8.24 | 77.92 | 4356 | 0.072 | 14508. |
| ALBUQUERQUE | | 35.08 | -106.62 | 0.440 | 63.0 | 12 | 2.02 | -49.4 | -128.3 | 0.427 | -7.86 | -114.35 | 6580 | 0.037 | 21450. |
| ALMIRANTE BROWN | | -64.88 | -62.87 | 0.366 | -59.4 | 16 | 2.51 | 36.6 | -65.7 | 0.441 | -12.95 | -60.08 | 9313 | 0.019 | 29741. |
| ANCON | | -11.77 | -77.15 | 0.239 | 1.1 | 5 | 1.10 | -12.9 | -77.3 | 0.237 | NO MINIMUM B BETWEEN | | INTERS. | | 134. |
| ANCHORAGE | | 61.17 | -149.98 | 0.466 | 74.3 | 25 | 4.40 | -53.8 | 172.3 | 0.525 | 2.61 | -168.66 | 21941 | 0.004 | 63991. |
| ANTOFAGASTA | | -23.65 | -70.42 | 0.224 | -18.4 | 5 | 1.14 | -3.2 | -69.8 | 0.259 | -16.17 | -69.97 | 592 | 0.209 | 2508. |
| APIA | | -13.80 | -171.77 | 0.328 | -29.4 | 12 | 1.12 | 16.2 | -165.9 | 0.288 | 2.70 | -168.49 | 917 | 0.223 | 3985. |
| APATITY | | 67.55 | 33.33 | 0.446 | 77.4 | 8 | 5.28 | -55.5 | 68.9 | 0.413 | 5.19 | 44.42 | 27181 | 0.002 | 78926. |
| ARKHANGELSK | | 64.58 | 40.50 | 0.448 | 76.3 | 10 | 4.27 | -51.5 | 68.7 | 0.402 | 5.75 | 48.26 | 20736 | 0.004 | 60947. |
| ARCETRI | | 43.75 | 11.25 | 0.381 | 59.2 | -2 | 1.79 | -30.5 | 25.1 | 0.275 | 3.75 | 16.73 | 4783 | 0.055 | 16193. |
| AREQUIPA | | -16.35 | -71.57 | 0.227 | -5.9 | 3 | 1.11 | -10.1 | -71.3 | 0.238 | -16.08 | -71.55 | 403 | 0.227 | 744. |
| ARGENTINE ISLAND | | -65.25 | -64.27 | 0.370 | -59.8 | 17 | 2.55 | 36.9 | -66.2 | 0.443 | -12.82 | -60.83 | 9562 | 0.019 | 30432. |
| ARMIDALE | | -30.30 | 151.40 | 0.464 | -60.8 | 10 | 1.76 | 46.8 | 159.9 | 0.397 | 8.30 | 156.79 | 5077 | 0.059 | 16996. |
| ASSWAN | | 23.97 | 32.78 | 0.325 | 30.9 | 1 | 1.12 | -4.8 | 33.7 | 0.279 | 7.66 | 32.99 | 921 | 0.219 | 3784. |
| ASO | | 32.88 | 131.02 | 0.385 | 46.3 | -3 | 1.24 | -16.0 | 130.1 | 0.402 | 8.97 | 131.29 | 1963 | 0.163 | 7567. |
| ASHKABAD | | 37.93 | 55.10 | 0.410 | 55.4 | 4 | 1.45 | -22.1 | 60.0 | 0.325 | 6.75 | 55.73 | 3084 | 0.101 | 10911. |
| ATHENS | | 37.97 | 23.72 | 0.370 | 52.5 | 0 | 1.46 | -21.1 | 30.2 | 0.282 | 5.86 | 25.93 | 2915 | 0.099 | 10503. |
| BAJA | | 46.18 | 19.00 | 0.393 | 61.7 | 0 | 1.91 | -32.7 | 32.5 | 0.282 | 4.28 | 23.63 | 5552 | 0.046 | 18405. |
| BAGHDAD | | 33.35 | 44.38 | 0.377 | 48.4 | 3 | 1.31 | -16.9 | 47.1 | 0.295 | 6.58 | 44.69 | 2145 | 0.136 | 8054. |
| BANGKOK | | 13.75 | 100.55 | 0.339 | 10.1 | 0 | 0.98 | 5.2 | 100.5 | 0.335 | 9.08 | 100.53 | 445 | 0.326 | 1022. |
| BAR I | | 69.58 | -140.18 | 0.487 | 81.2 | 35 | 9.78 | -62.2 | 164.0 | 0.548 | 2.17 | -168.61 | 56439 | 0.000 | 159170. |
| BALBOA | | 8.95 | -79.57 | 0.318 | 37.5 | 3 | 1.24 | -33.3 | -84.8 | 0.265 | -13.72 | -81.22 | 1393 | 0.160 | 5978. |
| BAIE ST. PAUL | | 47.43 | -70.50 | 0.477 | 75.4 | -16 | 4.23 | -75.1 | -78.0 | 0.442 | -12.37 | -65.40 | 20362 | 0.004 | 60509. |
| BARTER ISLAND | | 70.13 | -143.67 | 0.486 | 81.0 | 34 | 9.61 | -61.5 | 162.0 | 0.548 | 2.84 | -172.09 | 55397 | 0.000 | 156270. |
| BAKER LAKE | | 64.30 | -96.08 | 0.504 | 85.4 | 6 | 15.47 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | ** | | | |
| BATTLE CREEK | | 42.27 | -85.17 | 0.479 | 72.6 | -0 | 3.18 | -65.8 | -108.4 | 0.451 | -12.00 | -88.03 | 13826 | 0.009 | 41990. |
| BANARAS | | 25.33 | 83.02 | 0.378 | 35.1 | -0 | 1.09 | -6.6 | 84.7 | 0.350 | 8.68 | 83.62 | 1072 | 0.239 | 4317. |
| BANGUI | | 4.60 | 18.58 | 0.269 | -13.9 | -5 | 1.06 | 16.3 | 17.5 | 0.286 | 8.77 | 18.15 | 478 | 0.262 | 1411. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O R I G I N ** | | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | ARC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| BASE ROI BAUDOUIN | -70.43 | 23.32 | 0.388 | -66.7 | -33 | 5.70 | 59.8 | -31.4 | 0.437 | -5.47 | -11.41 | 29419 | 0.002 | 85971. |
| BANGUIO | 16.42 | 120.58 | 0.335 | 18.4 | 0 | 1.01 | -0.2 | 120.2 | 0.337 | 8.32 | 120.48 | 563 | 0.300 | 2034. |
| BELEM | -1.00 | -49.00 | 0.247 | 16.5 | -13 | 1.16 | -18.1 | -44.7 | 0.209 | -13.48 | -45.92 | 523 | 0.203 | 2149. |
| BELSK | 51.84 | 20.80 | 0.409 | 66.8 | 1 | 2.37 | -40.4 | 39.5 | 0.295 | 3.83 | 26.77 | 8429 | 0.024 | 26712. |
| BETTLES | 66.90 | -151.84 | 0.477 | 77.9 | 27 | 6.37 | -57.3 | 164.2 | 0.541 | 3.55 | -174.65 | 34641 | 0.001 | 98996. |
| BEDFORD | 42.48 | -71.28 | 0.467 | 72.4 | -12 | 3.28 | -70.3 | -78.2 | 0.419 | -12.65 | -67.37 | 14299 | 0.009 | 43605. |
| BERMUDA | 32.37 | -64.67 | 0.424 | 64.1 | -12 | 2.16 | -60.7 | -60.8 | 0.337 | -13.28 | -59.39 | 7047 | 0.031 | 23333. |
| BEOGRAD | 44.80 | 20.52 | 0.390 | 60.3 | 0 | 1.81 | -30.6 | 32.4 | 0.282 | 4.53 | 24.56 | 4976 | 0.053 | 16705. |
| BIRD | 56.50 | 94.20 | 0.494 | 74.6 | 1 | 2.59 | -37.8 | 100.9 | 0.480 | 9.63 | 95.63 | 10572 | 0.018 | 31986. |
| BISMARK | 46.82 | -100.77 | 0.490 | 74.2 | 12 | 3.58 | -62.7 | -134.6 | 0.486 | -9.11 | -110.07 | 16546 | 0.007 | 49328. |
| BJORNOYA | 74.52 | 19.02 | 0.451 | 80.2 | -1 | 10.11 | -63.5 | 76.6 | 0.456 | 4.51 | 41.45 | 58055 | 0.000 | 164435. |
| BOROK | 58.03 | 38.33 | 0.437 | 72.3 | 8 | 3.01 | -45.2 | 59.3 | 0.355 | 5.51 | 43.50 | 12693 | 0.012 | 38561. |
| BOLOGNA | 44.50 | 11.35 | 0.383 | 60.0 | -2 | 1.83 | -31.6 | 25.8 | 0.275 | 3.69 | 16.99 | 5065 | 0.051 | 17025. |
| BOULDER | 40.03 | -105.30 | 0.464 | 67.8 | 13 | 2.47 | -54.6 | -131.6 | 0.454 | -8.24 | -114.04 | 9474 | 0.020 | 29596. |
| BOMBAY | 19.00 | 72.83 | 0.346 | 23.5 | -1 | 1.03 | -1.4 | 74.2 | 0.323 | 7.71 | 73.43 | 663 | 0.280 | 2559. |
| BOGOTA | 4.63 | -74.08 | 0.295 | 31.9 | 1 | 1.20 | -30.8 | -76.8 | 0.243 | -14.92 | -74.78 | 1056 | 0.178 | 4730. |
| BRISBANE | -27.53 | 152.92 | 0.448 | -57.6 | 10 | 1.61 | 43.7 | 160.8 | 0.381 | 8.26 | 157.92 | 4121 | 0.076 | 14266. |
| BUDAPEST | 46.68 | 21.27 | 0.396 | 62.2 | 1 | 1.93 | -33.1 | 34.5 | 0.284 | 4.63 | 25.61 | 5724 | 0.044 | 18891. |
| BUENOS AIRES | -34.52 | -58.50 | 0.222 | -33.1 | 0 | 1.27 | 7.4 | -62.0 | 0.300 | -15.61 | -59.50 | 1297 | 0.154 | 5804. |
| BUNIA | 1.53 | 30.18 | 0.276 | -20.2 | -2 | 1.07 | 18.6 | 29.7 | 0.302 | 8.15 | 29.89 | 573 | 0.257 | 2098. |
| BYRD STATION | -79.98 | -120.02 | 0.497 | -75.2 | 68 | 7.82 | 56.1 | -79.3 | 0.497 | -11.95 | -78.51 | 43432 | 0.001 | 124242. |
| CAPRI | 40.57 | 14.33 | 0.372 | 55.6 | -1 | 1.60 | -25.4 | 24.8 | 0.277 | 4.88 | 18.45 | 3673 | 0.076 | 12851. |
| CASTEL TESINO | 46.05 | 11.65 | 0.388 | 61.5 | -2 | 1.94 | -33.8 | 27.4 | 0.276 | 3.58 | 17.64 | 5694 | 0.044 | 18871. |
| CATANIA | 37.50 | 15.07 | 0.362 | 51.7 | -1 | 1.46 | -21.1 | 23.5 | 0.278 | 5.49 | 18.47 | 2866 | 0.099 | 10383. |
| CAPE CHELYUSKIN | 77.72 | 104.28 | 0.485 | 85.3 | 11 | 9.57 | -56.3 | 112.8 | 0.532 | 10.91 | 104.58 | 55047 | 0.000 | 155094. |
| CAPE ZHELANIA | 76.90 | 68.60 | 0.475 | 83.7 | 20 | 9.60 | -57.8 | 97.8 | 0.502 | 9.40 | 78.50 | 55088 | 0.000 | 155517. |
| CAPE SCHMIDT | 68.87 | -179.48 | 0.470 | 77.2 | 11 | 5.48 | -52.8 | 150.7 | 0.543 | 7.06 | 164.09 | 28946 | 0.002 | 83150. |
| CAMBRIDGE UK | 52.22 | 0.10 | 0.402 | 67.3 | -8 | 2.65 | -46.3 | 27.1 | 0.285 | 1.01 | 10.71 | 10006 | 0.017 | 31420. |
| CARIBOU | 46.87 | -68.02 | 0.473 | 74.7 | -18 | 4.06 | -74.7 | -70.0 | 0.431 | -12.15 | -61.73 | 19214 | 0.005 | 57373. |
| CALCUTTA | 22.93 | 88.52 | 0.369 | 30.0 | -0 | 1.05 | -3.7 | 89.5 | 0.348 | 9.00 | 88.90 | 860 | 0.266 | 3464. |
| CAPE HALLETT | -72.32 | 178.22 | 0.543 | -83.5 | -88 | 16.72 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| CAMPBELL ISLAND | -52.55 | 169.15 | 0.525 | -76.1 | 27 | 4.25 | 61.6 | -155.3 | 0.462 | 3.76 | -173.12 | 20991 | 0.004 | 61350. |
| CANBERRA | -35.32 | 149.00 | 0.490 | -66.1 | 11 | 2.12 | 52.5 | 159.0 | 0.423 | 8.57 | 155.21 | 7398 | 0.033 | 23519. |
| CAPETOWN | -34.15 | 18.32 | 0.268 | -63.7 | -24 | 1.89 | 44.0 | -0.2 | 0.379 | 1.90 | 7.78 | 5368 | 0.046 | 18017. |
| CAMDEN | -34.08 | 150.68 | 0.483 | -64.6 | 11 | 2.01 | 50.9 | 160.7 | 0.415 | 8.40 | 156.86 | 6675 | 0.039 | 21510. |
| CAPE CANAVERAL | 28.40 | -80.60 | 0.423 | 61.1 | 0 | 1.88 | -53.9 | -92.5 | 0.366 | -12.96 | -82.12 | 5500 | 0.046 | 18605. |
| CAPE JONES | 54.50 | -79.50 | 0.497 | 80.3 | -14 | 6.87 | -78.7 | -115.5 | 0.492 | -12.08 | -78.93 | 37281 | 0.001 | 107213. |
| CEBU | 10.33 | 123.90 | 0.322 | 5.4 | 1 | 0.99 | 5.4 | 123.8 | 0.323 | 8.14 | 123.86 | 414 | 0.320 | 582. |
| CHAMICAL | -30.33 | -66.33 | 0.225 | -27.8 | 4 | 1.20 | 2.8 | -66.7 | 0.282 | -16.24 | -65.94 | 940 | 0.179 | 4324. |
| CHURCHILL | 58.77 | -94.17 | 0.506 | 82.8 | 4 | 8.97 | -74.5 | -151.3 | 0.522 | -9.58 | -103.80 | 50865 | 0.000 | 144432. |
| CHAMBON-LA-FORET | 48.02 | 2.27 | 0.391 | 63.7 | -6 | 2.18 | -39.3 | 23.5 | 0.273 | 1.90 | 10.87 | 7113 | 0.031 | 23088. |
| CHICAGO | 41.83 | -87.67 | 0.479 | 72.1 | 2 | 3.07 | -64.3 | -112.0 | 0.452 | -11.47 | -91.57 | 13160 | 0.011 | 40086. |
| CHARLOTTESVILLE | 38.03 | -78.22 | 0.462 | 69.6 | -4 | 2.68 | -64.4 | -92.4 | 0.415 | -12.63 | -78.15 | 10591 | 0.016 | 33077. |
| CHITA | 52.05 | 113.48 | 0.484 | 69.9 | -5 | 2.10 | -33.2 | 115.2 | 0.488 | 9.86 | 114.46 | 7539 | 0.033 | 23531. |
| CHITTAGONG | 22.35 | 91.82 | 0.367 | 28.7 | -0 | 1.04 | -3.1 | 92.5 | 0.349 | 9.08 | 92.08 | 815 | 0.272 | 3275. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O R I G I N ** | | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | | ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| CHRISTCHURCH | -43.57 | 172.80 | 0.492 | -68.9 | 20 | 2.56 | 52.9 | -162.6 | 0.425 | 4.24 | -174.63 | 10135 | 0.019 | 31326. |
| CHACALTAYA | -16.32 | -68.15 | 0.224 | -5.3 | 1 | 1.12 | -10.6 | -68.1 | 0.234 | NO MINIMUM B BETWEEN INTERS. | | | | 673. |
| CLIMAX | 39.37 | -106.18 | 0.460 | 67.1 | 13 | 2.38 | -53.6 | -131.8 | 0.451 | -8.02 | -114.89 | 8936 | 0.022 | 28084. |
| CLONCURRY | -20.67 | 140.50 | 0.423 | -50.9 | 6 | 1.37 | 37.7 | 143.1 | 0.384 | 9.11 | 142.86 | 2707 | 0.122 | 9969. |
| CONCORD | 43.20 | -71.53 | 0.470 | 72.9 | -12 | 3.40 | -71.0 | -79.2 | 0.424 | -12.74 | -67.64 | 15054 | 0.008 | 45707. |
| COOK | -30.63 | 130.40 | 0.481 | -63.6 | 3 | 1.86 | 49.0 | 132.2 | 0.452 | 9.70 | 132.53 | 5895 | 0.048 | 19065. |
| COLLEGE | 64.85 | -147.83 | 0.476 | 77.1 | 28 | 5.80 | -57.0 | 168.6 | 0.536 | 2.77 | -169.67 | 30914 | 0.002 | 88743. |
| CORINALDO | 43.63 | 13.00 | 0.381 | 59.0 | -2 | 1.77 | -30.0 | 26.2 | 0.276 | 4.16 | 18.08 | 4693 | 0.057 | 15910. |
| COIMBRA | 40.22 | -8.42 | 0.367 | 57.0 | -10 | 1.75 | -32.0 | 10.4 | 0.261 | 0.88 | 0.18 | 4437 | 0.059 | 15329. |
| CONCEPCION | -36.58 | -72.98 | 0.249 | -36.6 | 11 | 1.28 | 9.2 | -71.0 | 0.317 | -15.36 | -70.79 | 1524 | 0.147 | 6554. |
| CORDOBA | -31.32 | -64.22 | 0.223 | -29.0 | 3 | 1.22 | 3.8 | -65.3 | 0.286 | -16.12 | -64.14 | 1010 | 0.173 | 4633. |
| COLOMBO | 6.90 | 79.87 | 0.325 | -5.9 | -3 | 0.99 | 11.8 | 79.6 | 0.329 | 8.45 | 79.77 | 413 | 0.323 | 578. |
| COCOS ISLAND | -12.20 | 96.90 | 0.383 | -44.7 | -2 | 1.18 | 31.0 | 95.8 | 0.408 | 9.08 | 96.17 | 1683 | 0.187 | 6457. |
| COPENHAGEN | 55.75 | 12.50 | 0.413 | 69.7 | -2 | 2.92 | -47.4 | 39.0 | 0.307 | 2.63 | 21.69 | 11840 | 0.013 | 36488. |
| CORAL HARBOUR | 64.20 | -83.40 | 0.499 | 85.1 | -23 | 17.68 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| CRACOW | 50.05 | 19.95 | 0.404 | 65.3 | 0 | 2.21 | -38.0 | 36.9 | 0.289 | 4.08 | 25.48 | 7400 | 0.030 | 23760. |
| CURACAO | 12.08 | -68.84 | 0.331 | 43.2 | -3 | 1.35 | -40.0 | -69.8 | 0.254 | -15.13 | -67.84 | 1888 | 0.128 | 7838. |
| CUZCO | -13.52 | -71.98 | 0.232 | -0.7 | 3 | 1.11 | -12.8 | -71.9 | 0.233 | NO MINIMUM B BETWEEN INTERS. | | | | 89. |
| DAVIS | -68.60 | 78.00 | 0.470 | -74.6 | -67 | 15.64 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| DAPANGO | 10.80 | 0.07 | 0.263 | 5.7 | -10 | 1.07 | 5.8 | 1.1 | 0.256 | 6.45 | 0.96 | 407 | 0.256 | 608. |
| DALLAS | 32.78 | -96.80 | 0.439 | 62.8 | 8 | 1.99 | -51.4 | -116.3 | 0.411 | -10.05 | -102.70 | 6342 | 0.039 | 20830. |
| DAKAR | 14.66 | -17.43 | 0.272 | 22.1 | -13 | 1.13 | -6.6 | -11.4 | 0.237 | 1.44 | -13.83 | 662 | 0.213 | 2756. |
| DARWIN-COONAWARRA | -12.43 | 130.90 | 0.382 | -39.7 | 3 | 1.16 | 28.9 | 131.7 | 0.366 | 8.83 | 131.85 | 1466 | 0.198 | 5930. |
| DEBRECEN | 47.48 | 21.65 | 0.398 | 63.0 | 1 | 1.99 | -34.2 | 35.5 | 0.285 | 4.32 | 26.17 | 6070 | 0.040 | 19900. |
| DE BILT | 52.10 | 5.18 | 0.402 | 67.0 | -5 | 2.56 | -44.4 | 29.9 | 0.286 | 1.92 | 14.56 | 9458 | 0.019 | 29804. |
| DEEP RIVER | 46.10 | -77.50 | 0.483 | 75.3 | -9 | 3.97 | -72.2 | -96.5 | 0.454 | -12.58 | -76.38 | 18787 | 0.005 | 55971. |
| DENVER | 39.75 | -105.00 | 0.463 | 67.6 | 13 | 2.45 | -54.5 | -131.0 | 0.453 | -8.07 | -113.58 | 9326 | 0.021 | 29181. |
| DEHRA DUN | 30.33 | 78.05 | 0.399 | 44.4 | 0 | 1.19 | -12.3 | 80.8 | 0.360 | 8.28 | 78.85 | 1658 | 0.183 | 6372. |
| DELHI | 28.63 | 77.22 | 0.391 | 41.6 | -0 | 1.15 | -10.6 | 79.8 | 0.353 | 8.06 | 78.01 | 1448 | 0.200 | 5673. |
| DECEPCION | -62.98 | -60.72 | 0.351 | -57.7 | 14 | 2.34 | 34.7 | -64.7 | 0.433 | -13.10 | -59.09 | 8201 | 0.024 | 26613. |
| DIXON ISLAND | 73.53 | 80.70 | 0.482 | 83.3 | 17 | 7.08 | -54.0 | 100.2 | 0.505 | 10.11 | 85.87 | 39036 | 0.001 | 111023. |
| DJIBOUTI | 11.55 | 43.15 | 0.295 | 6.5 | 0 | 1.03 | 6.0 | 43.2 | 0.286 | 6.89 | 43.16 | 410 | 0.285 | 661. |
| DJAKARTA | -6.17 | 107.00 | 0.362 | -32.7 | 1 | 1.07 | 24.2 | 107.2 | 0.373 | 8.74 | 107.19 | 985 | 0.252 | 4025. |
| DODAIRA | 36.00 | 139.20 | 0.383 | 49.3 | -4 | 1.32 | -19.0 | 137.3 | 0.415 | 9.19 | 139.22 | 2411 | 0.136 | 9035. |
| DOLGOPRUDNAYA | 55.94 | 37.52 | 0.433 | 70.8 | 7 | 2.73 | -43.0 | 56.4 | 0.341 | 5.37 | 42.09 | 10915 | 0.015 | 33578. |
| DOURBES | 50.10 | 4.60 | 0.397 | 65.4 | -5 | 2.35 | -41.7 | 27.2 | 0.279 | 1.84 | 13.41 | 8160 | 0.025 | 26092. |
| DUNSINK | 53.38 | -6.33 | 0.406 | 68.5 | -11 | 2.93 | -50.6 | 25.2 | 0.293 | -0.34 | 6.25 | 11747 | 0.013 | 36436. |
| DUSHETTI | 42.08 | 44.70 | 0.409 | 59.3 | 5 | 1.63 | -26.6 | 51.3 | 0.309 | 6.34 | 45.72 | 4086 | 0.072 | 13949. |
| DURHAM | 43.08 | -70.92 | 0.468 | 72.8 | -13 | 3.37 | -71.0 | -77.5 | 0.421 | -12.80 | -66.74 | 14888 | 0.008 | 45260. |
| DUMONT D'URVILLE | -66.67 | 140.02 | 0.553 | -89.6 | -28 | 36.13 | ** NO COMPUTATIONS PERFORMED ** | | | | | | | |
| DURBAN | -29.83 | 31.03 | 0.281 | -62.9 | -19 | 1.77 | 44.2 | 19.4 | 0.387 | 4.55 | 23.45 | 4758 | 0.056 | 16068. |
| EDINBURGH | 55.92 | -3.18 | 0.411 | 70.1 | -10 | 3.24 | -52.8 | 30.5 | 0.308 | 0.20 | 9.78 | 13798 | 0.009 | 42187. |
| EIGHTS | -75.23 | -77.17 | 0.441 | -68.1 | 31 | 4.25 | 47.6 | -70.2 | 0.477 | -12.52 | -64.93 | 20537 | 0.004 | 61004. |
| ELLSWORTH | -77.72 | -41.13 | 0.426 | -67.5 | 7 | 4.92 | 51.3 | -59.9 | 0.467 | -11.35 | -48.70 | 24615 | 0.003 | 72535. |
| ELISABETHVILLE | -11.63 | 27.42 | 0.279 | -45.3 | -7 | 1.24 | 30.5 | 24.1 | 0.342 | 7.13 | 25.31 | 1576 | 0.162 | 6214. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O R I G I N ** | | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | | ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| ENNADAI | 61.30 | -101.20 | 0.506 | 83.5 | 16 | 10.26 | -72.5 | -163.6 | 0.532 | -7.94 | -116.04 | 59154 | 0.000 | 167181. |
| ENUGU | 6.47 | 7.55 | 0.261 | -7.0 | -9 | 1.06 | 12.4 | 6.6 | 0.270 | 7.71 | 7.34 | 414 | 0.261 | 718. |
| ESKDALEMUIR | 55.32 | -3.20 | 0.409 | 69.7 | -10 | 3.15 | -52.0 | 29.6 | 0.304 | -0.01 | 9.54 | 13166 | 0.010 | 40412. |
| ESPERANZA | -63.38 | -56.98 | 0.349 | -57.8 | 12 | 2.38 | 35.4 | -63.3 | 0.433 | -12.71 | -56.90 | 8446 | 0.023 | 27329. |
| EUREKA | 80.00 | -85.93 | 0.483 | 88.1 | 75 | 331.26 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| FAREWELL | 62.53 | -153.90 | 0.466 | 74.7 | 24 | 4.57 | -53.6 | 168.8 | 0.528 | 3.51 | -172.68 | 23021 | 0.003 | 66954. |
| FANNING ISLAND | 3.92 | -159.38 | 0.277 | 9.6 | 10 | 1.05 | -5.2 | -161.1 | 0.288 | 0.80 | -159.95 | 442 | 0.273 | 1111. |
| FLIN FLON | 54.70 | -102.00 | 0.504 | 79.5 | 14 | 5.82 | -68.3 | -148.6 | 0.515 | -8.18 | -114.02 | 30845 | 0.002 | 88927. |
| FORT YUKON | 66.57 | -145.30 | 0.481 | 78.6 | 30 | 6.87 | -58.9 | 167.2 | 0.541 | 2.62 | -169.22 | 37804 | 0.001 | 107754. |
| FORT NORMAN | 64.90 | -125.50 | 0.495 | 81.0 | 34 | 8.69 | -64.4 | 177.5 | 0.541 | -1.52 | -149.74 | 49381 | 0.000 | 139837. |
| FORT CHIMO | 58.10 | -68.43 | 0.486 | 80.5 | -30 | 8.81 | -85.0 | -80.6 | 0.481 | -11.77 | -59.73 | 49520 | 0.000 | 141352. |
| FORT MONMOUTH | 40.25 | -74.02 | 0.465 | 71.1 | -9 | 2.97 | -67.7 | -84.3 | 0.416 | -12.71 | -71.75 | 12349 | 0.012 | 38093. |
| FORT BELVOIR | 38.73 | -77.13 | 0.463 | 70.2 | -5 | 2.77 | -65.4 | -90.6 | 0.416 | -12.78 | -76.50 | 11131 | 0.014 | 34614. |
| FORT RANDOLPH | 9.38 | -79.88 | 0.320 | 38.1 | 3 | 1.25 | -33.6 | -85.3 | 0.267 | -13.57 | -81.58 | 1435 | 0.158 | 6127. |
| FORT DE FRANCE | 14.10 | -61.02 | 0.332 | 44.7 | -9 | 1.40 | -41.1 | -55.6 | 0.236 | -14.81 | -57.31 | 2071 | 0.117 | 8532. |
| FREETOWN | 8.47 | -13.22 | 0.254 | 7.6 | -14 | 1.09 | 1.6 | -11.3 | 0.242 | 2.77 | -11.69 | 417 | 0.242 | 851. |
| FROBISHER | 63.75 | -68.57 | 0.486 | 82.7 | -39 | 15.54 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| FREIBURG | 48.05 | 7.58 | 0.392 | 63.5 | -4 | 2.13 | -37.7 | 26.7 | 0.276 | 2.52 | 15.05 | 6815 | 0.033 | 22180. |
| FRONT ROYAL | 38.93 | -78.18 | 0.465 | 70.3 | -4 | 2.79 | -65.3 | -92.8 | 0.420 | -12.61 | -78.01 | 11264 | 0.014 | 34965. |
| FT. DAVIS | 30.63 | -103.95 | 0.421 | 59.0 | 11 | 1.77 | -46.1 | -122.1 | 0.400 | -8.57 | -110.49 | 4990 | 0.055 | 16931. |
| GARCHY | 47.30 | 3.07 | 0.389 | 63.0 | -6 | 2.11 | -38.0 | 23.3 | 0.272 | 2.08 | 11.27 | 6684 | 0.034 | 21835. |
| GAINESVILLE | 29.63 | -82.30 | 0.429 | 62.1 | 1 | 1.94 | -54.5 | -95.6 | 0.376 | -12.72 | -84.33 | 5906 | 0.042 | 19745. |
| GENOVA MONTE CAPEL | 44.55 | 8.95 | 0.382 | 60.1 | -3 | 1.85 | -32.2 | 24.3 | 0.274 | 3.48 | 15.07 | 5165 | 0.050 | 17337. |
| GENERAL BELGRANO | -77.97 | -38.80 | 0.427 | -67.6 | 6 | 5.03 | 51.7 | -59.4 | 0.466 | -10.93 | -47.81 | 25326 | 0.002 | 74514. |
| GENERAL SAN MARTIN | -68.13 | -67.43 | 0.392 | -62.2 | 20 | 2.88 | 39.9 | -67.4 | 0.454 | -12.92 | -62.07 | 11722 | 0.013 | 36481. |
| GHANA | 10.00 | 4.00 | 0.264 | 2.3 | -9 | 1.06 | 8.0 | 4.4 | 0.261 | NO MINIMUM B BETWEEN INTERS. | | | | 241. |
| GIFU | 35.58 | 137.08 | 0.386 | 49.1 | -4 | 1.31 | -18.6 | 135.5 | 0.414 | 9.01 | 137.21 | 2351 | 0.140 | 8830. |
| GILGIT | 35.94 | 74.30 | 0.423 | 53.0 | 1 | 1.34 | -18.5 | 78.4 | 0.371 | 7.92 | 75.19 | 2595 | 0.127 | 9326. |
| GOUGH ISLAND | -40.35 | -9.89 | 0.243 | -56.7 | -25 | 1.78 | 34.1 | -33.3 | 0.368 | -5.35 | -22.40 | 4495 | 0.056 | 15797. |
| GODHAVN | 69.23 | -53.52 | 0.471 | 82.0 | -46 | 22.60 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| GOOSE BAY | 53.32 | -60.38 | 0.470 | 76.7 | -28 | 5.64 | -79.7 | -40.4 | 0.438 | -11.23 | -48.78 | 29168 | 0.002 | 85156. |
| GOTTINGEN | 51.53 | 9.93 | 0.402 | 66.5 | -3 | 2.43 | -42.2 | 32.0 | 0.286 | 2.59 | 18.04 | 8730 | 0.022 | 27675. |
| GRYTVIKEN | -54.27 | -36.50 | 0.277 | -52.7 | -5 | 1.95 | 30.9 | -53.5 | 0.396 | -11.54 | -44.67 | 5541 | 0.043 | 19086. |
| GRAZ | 47.07 | 15.47 | 0.393 | 62.5 | -1 | 1.99 | -34.5 | 30.8 | 0.280 | 3.95 | 20.98 | 6028 | 0.040 | 19818. |
| GROCKA | 44.63 | 20.77 | 0.390 | 60.2 | 0 | 1.80 | -30.3 | 32.4 | 0.282 | 4.79 | 24.70 | 4910 | 0.054 | 15505. |
| GRAND BAHAMA | 26.67 | -78.37 | 0.413 | 59.7 | -0 | 1.80 | -52.9 | -88.3 | 0.351 | -13.27 | -79.23 | 4964 | 0.052 | 17090. |
| GRAHAMSTOWN | -33.28 | 26.48 | 0.276 | -64.2 | -23 | 1.91 | 45.6 | 10.9 | 0.386 | 3.42 | 16.96 | 5522 | 0.045 | 18375. |
| GREAT WHALE RIVER | 55.27 | -77.78 | 0.495 | 80.6 | -17 | 7.30 | -80.0 | -113.1 | 0.491 | -11.98 | -76.00 | 39962 | 0.001 | 114678. |
| GULMARG | 34.05 | 74.40 | 0.414 | 50.3 | 1 | 1.28 | -16.6 | 78.1 | 0.365 | 7.91 | 75.27 | 2249 | 0.144 | 8265. |
| GUANTANAMO BAY | 19.90 | -75.15 | 0.377 | 52.7 | -0 | 1.53 | -46.9 | -81.2 | 0.306 | -14.06 | -75.44 | 3201 | 0.085 | 11920. |
| GUAM | 13.45 | 144.75 | 0.302 | 11.6 | 2 | 1.02 | 2.2 | 144.2 | 0.313 | 8.89 | 144.58 | 466 | 0.293 | 1348. |
| GUAYAQUIL | -2.17 | -79.88 | 0.267 | 18.5 | 5 | 1.12 | -21.3 | -82.2 | 0.239 | -13.79 | -81.04 | 584 | 0.221 | 2367. |
| HAMMAGHIR | 30.10 | 0. | 0.328 | 42.6 | -7 | 1.29 | -15.0 | 9.2 | 0.264 | 4.73 | 4.52 | 1759 | 0.143 | 6933. |
| HACHIJOJIMA | 33.13 | 139.80 | 0.369 | 45.5 | -3 | 1.25 | -16.3 | 138.1 | 0.400 | 8.99 | 139.76 | 1964 | 0.160 | 7638. |
| HALLETT | -72.32 | 170.22 | 0.546 | -84.8 | -79 | 22.37 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| HARTLAND | 51.00 | -4.48 | 0.399 | 66.6 | -10 | 2.58 | -46.3 | 23.1 | 0.281 | 0.09 | 6.75 | 9575 | 0.019 | 30245. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O R I G I N ** | | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | ARC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| HARVSTVA | 60.22 | 10.25 | 0.421 | 72.6 | -3 | 3.74 | -53.6 | 44.5 | 0.337 | 2.11 | 22.18 | 17091 | 0.006 | 51252. |
| HAMBURG | 53.63 | 10.00 | 0.407 | 68.1 | -3 | 2.67 | -45.2 | 34.7 | 0.294 | 2.30 | 18.91 | 10238 | 0.017 | 31980. |
| HALLE | 51.48 | 11.93 | 0.403 | 66.4 | -2 | 2.41 | -41.7 | 33.2 | 0.287 | 2.78 | 19.60 | 8582 | 0.023 | 27232. |
| HALIFAX | 44.60 | -63.60 | 0.460 | 72.5 | -19 | 3.52 | -72.3 | -56.4 | 0.403 | -12.10 | -55.65 | 15688 | 0.007 | 47639. |
| HANNOVER USA | 43.70 | -72.30 | 0.472 | 73.3 | -12 | 3.49 | -71.3 | -81.4 | 0.429 | -12.53 | -68.72 | 15641 | 0.007 | 47327. |
| HABANA | 23.15 | -82.35 | 0.396 | 55.4 | 2 | 1.61 | -47.6 | -93.0 | 0.338 | -13.02 | -84.57 | 3802 | 0.073 | 13623. |
| HALLEY BAY | -75.52 | -26.60 | 0.406 | -66.0 | -2 | 4.57 | 51.0 | -54.8 | 0.457 | -10.51 | -41.79 | 22331 | 0.003 | 66260. |
| HAIFA | 32.83 | 35.10 | 0.363 | 46.4 | 2 | 1.29 | -15.3 | 37.8 | 0.286 | 6.78 | 35.65 | 1977 | 0.142 | 7527. |
| HAMILTON MASS. | 42.02 | -72.17 | 0.467 | 72.2 | -11 | 3.21 | -69.8 | -80.4 | 0.419 | -12.81 | -68.76 | 13889 | 0.009 | 42443. |
| HERSTMONCEUX | 50.90 | 0.33 | 0.399 | 66.2 | -7 | 2.49 | -44.3 | 25.6 | 0.280 | 0.92 | 10.43 | 9023 | 0.021 | 28615. |
| HEISS | 80.20 | 57.48 | 0.471 | 84.1 | 17 | 13.75 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| HEALY | 63.85 | -119.00 | 0.499 | 81.7 | 33 | 9.10 | -66.3 | -177.9 | 0.540 | -3.18 | -141.67 | 51907 | 0.000 | 146881. |
| HEL | 54.60 | 18.80 | 0.414 | 68.9 | 0 | 2.69 | -44.5 | 41.4 | 0.305 | 3.25 | 26.19 | 10460 | 0.016 | 32516. |
| HELWAN | 29.87 | 31.33 | 0.346 | 41.2 | 1 | 1.22 | -11.4 | 33.5 | 0.282 | 7.07 | 31.90 | 1521 | 0.169 | 6015. |
| HERMANUS | -34.42 | 19.22 | 0.269 | -63.9 | -24 | 1.91 | 44.4 | 0.8 | 0.380 | 2.08 | 8.61 | 5485 | 0.045 | 18349. |
| HIRAISO | 36.37 | 140.62 | 0.382 | 49.6 | -4 | 1.33 | -19.3 | 138.5 | 0.417 | 9.14 | 140.55 | 2468 | 0.133 | 9223. |
| HIGHCLIFF | -45.88 | 170.58 | 0.503 | -71.1 | 21 | 2.90 | 55.8 | -162.6 | 0.436 | 4.19 | -175.90 | 12344 | 0.013 | 37448. |
| HONOLULU | 21.30 | -158.10 | 0.305 | 38.5 | 11 | 1.20 | -20.3 | -166.6 | 0.351 | 1.49 | -161.99 | 1443 | 0.180 | 6021. |
| HOBART | -42.92 | 147.17 | 0.520 | -72.8 | 13 | 3.02 | 60.6 | 161.6 | 0.452 | 8.62 | 155.14 | 13198 | 0.011 | 39619. |
| HOLLANDIA | -2.50 | 140.52 | 0.330 | -21.2 | 4 | 1.05 | 18.3 | 141.3 | 0.314 | 8.81 | 141.10 | 641 | 0.274 | 2585. |
| HURBANOVO | 47.90 | 18.20 | 0.397 | 63.3 | 0 | 2.04 | -35.3 | 33.5 | 0.283 | 4.16 | 23.42 | 6341 | 0.038 | 20711. |
| HUMAIN | 50.20 | 5.35 | 0.397 | 65.5 | -5 | 2.35 | -41.6 | 27.7 | 0.279 | 1.96 | 14.03 | 8170 | 0.025 | 26115. |
| HUANCAYO | -12.05 | -75.33 | 0.237 | 1.2 | 4 | 1.10 | -13.3 | -75.4 | 0.235 | NO MINIMUM B BETWEEN INTERS. | | | | 143. |
| HYDERABAD | 17.42 | 78.45 | 0.343 | 19.2 | -1 | 1.01 | 1.0 | 79.4 | 0.327 | 8.32 | 78.92 | 568 | 0.299 | 2011. |
| IBADAN | 7.37 | 3.97 | 0.260 | -3.6 | -10 | 1.06 | 10.4 | 3.4 | 0.264 | NO MINIMUM B BETWEEN INTERS. | | | | 370. |
| I. CROZET | -46.50 | 52.00 | 0.335 | -65.8 | -38 | 3.03 | 57.7 | 28.5 | 0.427 | 4.34 | 35.23 | 12736 | 0.011 | 38817. |
| IL QORTIN | 36.22 | 14.30 | 0.356 | 50.0 | -2 | 1.41 | -19.5 | 22.3 | 0.277 | 5.60 | 17.60 | 2591 | 0.108 | 9533. |
| INUVIK | 68.20 | -133.70 | 0.490 | 81.4 | 37 | 9.84 | -63.4 | 168.4 | 0.546 | 0.67 | -161.36 | 56770 | 0.000 | 160141. |
| INVERCARGILL | -46.42 | 168.32 | 0.508 | -71.9 | 21 | 3.05 | 57.2 | -164.7 | 0.439 | 4.62 | -178.12 | 13265 | 0.011 | 39988. |
| INVERNESS | 57.45 | -4.25 | 0.414 | 71.2 | -11 | 3.55 | -55.1 | 32.4 | 0.320 | -0.13 | 9.73 | 15765 | 0.007 | 47721. |
| IQUITOS | -3.67 | -73.33 | 0.259 | 17.6 | 2 | 1.13 | -22.3 | -74.6 | 0.229 | -15.40 | -73.90 | 564 | 0.216 | 2286. |
| IRKUTSK | 52.27 | 104.30 | 0.489 | 70.8 | -2 | 2.14 | -33.5 | 107.8 | 0.481 | 9.93 | 105.43 | 7784 | 0.031 | 24181. |
| ISLA DE PASCUA | -27.17 | -109.43 | 0.294 | -36.2 | 14 | 1.20 | 12.2 | -102.2 | 0.321 | -8.48 | -105.45 | 1293 | 0.178 | 5535. |
| ISFJORD | 78.07 | 13.63 | 0.456 | 81.8 | -7 | 15.39 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| ITHACA | 42.45 | -76.52 | 0.474 | 72.8 | -8 | 3.29 | -69.2 | -91.3 | 0.434 | -12.80 | -75.24 | 14415 | 0.009 | 43813. |
| IVALO | 68.60 | 27.48 | 0.444 | 77.6 | 5 | 5.84 | -57.6 | 67.8 | 0.415 | 4.52 | 40.83 | 30714 | 0.002 | 88800. |
| JICAMARCA | -11.95 | -76.87 | 0.239 | 0.9 | 5 | 1.10 | -12.8 | -77.0 | 0.237 | NO MINIMUM B BETWEEN INTERS. | | | | 104. |
| JODRELL BANK | 53.23 | -2.30 | 0.404 | 68.2 | -9 | 2.82 | -48.7 | 27.1 | 0.291 | 0.43 | 9.29 | 11087 | 0.014 | 34522. |
| JOHANNESBURG | -26.20 | 28.03 | 0.279 | -61.0 | -16 | 1.63 | 41.5 | 18.0 | 0.377 | 4.99 | 21.68 | 3882 | 0.072 | 13462. |
| JUPITER | 27.02 | -80.12 | 0.416 | 59.8 | 0 | 1.81 | -52.6 | -91.2 | 0.357 | -13.15 | -81.55 | 5030 | 0.052 | 17253. |
| JULIANEHAAB | 60.72 | -46.03 | 0.456 | 77.5 | -34 | 7.82 | -78.7 | 16.0 | 0.434 | -8.08 | -26.32 | 43037 | 0.001 | 123697. |
| JULIUSRUH-RUGEN | 54.63 | 13.38 | 0.411 | 68.8 | -1 | 2.76 | -45.7 | 38.0 | 0.301 | 2.68 | 21.93 | 10804 | 0.015 | 33549. |
| JUNGFRAUJOCH | 46.55 | 7.98 | 0.388 | 62.1 | -4 | 2.00 | -35.4 | 25.5 | 0.274 | 3.08 | 14.86 | 6063 | 0.040 | 19979. |
| KANOYA | 31.42 | 130.89 | 0.378 | 44.3 | -3 | 1.21 | -14.7 | 130.1 | 0.395 | 8.81 | 131.12 | 1766 | 0.176 | 6928. |
| KARACHI | 24.85 | 67.02 | 0.366 | 35.8 | -0 | 1.11 | -8.2 | 69.3 | 0.325 | 7.27 | 67.73 | 1112 | 0.224 | 4498. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| KAZACHIE | 70.70 | 136.40 | 0.487 | 80.6 | -7 | 5.41 | -50.2 | 128.5 | 0.542 | 10.38 | 131.39 | 28506 | 0.002 | 81730. |
| KAP TOBIN | 70.42 | -21.97 | 0.447 | 79.1 | -28 | 11.85 | -72.4 | 59.0 | 0.446 | -2.08 | 6.91 | 68793 | 0.000 | 194713. |
| KAZAN | 55.83 | 48.82 | 0.447 | 71.7 | 10 | 2.67 | -41.5 | 65.1 | 0.368 | 6.49 | 52.04 | 10681 | 0.016 | 32765. |
| KAKICKA | 36.23 | 140.18 | 0.383 | 49.5 | -4 | 1.32 | -19.2 | 138.2 | 0.416 | 9.06 | 140.13 | 2446 | 0.134 | 9151. |
| KAMPALA | 0.33 | 32.58 | 0.277 | -22.3 | -2 | 1.07 | 19.4 | 32.1 | 0.307 | 7.92 | 32.29 | 617 | 0.252 | 2357. |
| KEKAHA | 21.84 | -159.72 | 0.305 | 38.9 | 12 | 1.21 | -20.2 | -168.3 | 0.354 | 2.00 | -163.63 | 1469 | 0.178 | 6114. |
| KHARTOUM | 15.58 | 32.58 | 0.296 | 13.1 | 0 | 1.05 | 4.2 | 32.8 | 0.278 | 8.15 | 32.66 | 472 | 0.271 | 1363. |
| KHABAROVSK | 48.52 | 135.12 | 0.445 | 63.7 | -8 | 1.82 | -30.3 | 132.7 | 0.479 | 9.52 | 135.21 | 5686 | 0.051 | 18502. |
| KHARKOV | 50.00 | 36.23 | 0.420 | 66.1 | 6 | 2.14 | -36.2 | 49.4 | 0.312 | 5.59 | 39.26 | 7139 | 0.032 | 22869. |
| KIEL | 54.30 | 10.10 | 0.409 | 68.6 | -3 | 2.76 | -46.1 | 35.6 | 0.297 | 2.20 | 19.27 | 10769 | 0.015 | 33486. |
| KIRUNA | 67.83 | 20.43 | 0.439 | 77.0 | 1 | 5.75 | -58.5 | 63.1 | 0.404 | 3.50 | 35.00 | 30050 | 0.002 | 87078. |
| KING SALMON | 58.70 | -156.70 | 0.452 | 71.6 | 21 | 3.54 | -49.9 | 171.4 | 0.515 | 3.66 | -172.56 | 16426 | 0.007 | 48749. |
| KIEV | 50.45 | 30.50 | 0.414 | 66.1 | 4 | 2.19 | -37.3 | 45.2 | 0.303 | 4.91 | 34.41 | 7416 | 0.030 | 23719. |
| KINGSTON | 18.00 | -76.80 | 0.367 | 50.3 | 0 | 1.46 | -44.3 | -83.4 | 0.300 | -14.04 | -77.70 | 2782 | 0.098 | 10608. |
| KNOB LAKE | 54.80 | -66.82 | 0.482 | 78.7 | -26 | 6.67 | -82.1 | -67.5 | 0.464 | -11.67 | -58.10 | 35850 | 0.001 | 103550. |
| KOROR ISLAND | 7.16 | 123.48 | 0.322 | -1.6 | 1 | 0.99 | 8.6 | 123.5 | 0.322 | 8.11 | 123.50 | 401 | 0.322 | 171. |
| KOTZEBUE | 66.88 | -162.60 | 0.470 | 76.7 | 21 | 5.49 | -54.6 | 159.9 | 0.539 | 4.95 | 177.46 | 29327 | 0.002 | 84292. |
| KOLN | 50.93 | 6.92 | 0.400 | 66.0 | -4 | 2.41 | -42.2 | 29.5 | 0.282 | 2.04 | 15.52 | 8527 | 0.023 | 27127. |
| KOMURO | 35.98 | 139.62 | 0.383 | 49.2 | -4 | 1.32 | -19.0 | 137.7 | 0.415 | 9.16 | 139.61 | 2406 | 0.137 | 9023. |
| KOKUBUNJI | 35.70 | 139.48 | 0.382 | 48.9 | -4 | 1.31 | -18.7 | 137.6 | 0.414 | 8.97 | 139.47 | 2360 | 0.139 | 8879. |
| KODAIKANAL | 10.23 | 77.48 | 0.325 | 2.6 | -2 | 0.99 | 8.1 | 77.6 | 0.323 | 8.22 | 77.61 | 401 | 0.323 | 252. |
| KUHLUNGSBORN | 54.12 | 11.93 | 0.409 | 68.5 | -2 | 2.71 | -45.4 | 36.5 | 0.298 | 2.69 | 20.57 | 10490 | 0.016 | 32671. |
| KUMASI | 6.67 | -1.58 | 0.255 | -2.6 | -11 | 1.07 | 8.9 | -2.1 | 0.258 | NO MINIMUM B BETWEEN INTERS. | | | | 268. |
| KYOTO | 35.02 | 135.78 | 0.386 | 48.5 | -4 | 1.29 | -18.0 | 134.4 | 0.412 | 9.16 | 135.96 | 2265 | 0.145 | 8556. |
| L'AQUILA | 42.40 | 13.32 | 0.378 | 57.7 | -2 | 1.70 | -28.2 | 25.4 | 0.276 | 4.34 | 18.05 | 4259 | 0.064 | 14617. |
| LA MADDALENA | 41.22 | 9.40 | 0.372 | 56.5 | -3 | 1.65 | -27.3 | 22.0 | 0.274 | 4.17 | 14.58 | 3977 | 0.069 | 13797. |
| LAHORE | 31.55 | 74.33 | 0.403 | 46.6 | 0 | 1.22 | -14.0 | 77.6 | 0.357 | 7.83 | 75.18 | 1853 | 0.168 | 7018. |
| LA PLATA | -34.90 | -57.90 | 0.222 | -33.5 | 0 | 1.28 | 7.9 | -61.6 | 0.302 | -15.67 | -59.02 | 1336 | 0.151 | 5959. |
| LA QUIACA | -22.10 | -65.60 | 0.218 | -15.3 | 1 | 1.14 | -5.1 | -65.9 | 0.249 | -16.77 | -65.59 | 520 | 0.211 | 2064. |
| LA PAZ | -16.48 | -68.05 | 0.224 | -5.6 | 1 | 1.12 | -10.5 | -68.0 | 0.235 | NO MINIMUM B BETWEEN INTERS. | | | | 710. |
| LAE | -6.72 | 147.00 | 0.343 | -28.6 | 5 | 1.09 | 22.6 | 148.8 | 0.314 | 9.01 | 148.24 | 880 | 0.242 | 3796. |
| LA GRAU | 43.10 | 6.00 | 0.377 | 58.7 | -5 | 1.78 | -30.8 | 21.3 | 0.272 | 3.32 | 12.33 | 4723 | 0.056 | 16049. |
| LA HAYE | 52.10 | 4.30 | 0.402 | 67.0 | -5 | 2.57 | -44.7 | 29.4 | 0.285 | 1.47 | 13.94 | 9528 | 0.019 | 30018. |
| LEEDS | 53.80 | -1.55 | 0.406 | 68.5 | -9 | 2.88 | -49.2 | 28.3 | 0.294 | 0.34 | 10.14 | 11491 | 0.013 | 35662. |
| LEICESTER | 52.62 | -1.10 | 0.403 | 67.6 | -8 | 2.72 | -47.4 | 27.0 | 0.287 | 0.68 | 9.96 | 10445 | 0.016 | 32684. |
| LERWICK | 60.13 | -1.18 | 0.420 | 72.7 | -10 | 4.04 | -57.2 | 38.5 | 0.339 | 0.40 | 13.52 | 18908 | 0.005 | 56467. |
| LENINGRAD | 59.95 | 30.70 | 0.433 | 73.0 | 6 | 3.38 | -48.6 | 56.4 | 0.354 | 4.65 | 37.97 | 14955 | 0.008 | 45002. |
| LEIDSCHENDAM | 52.08 | 4.38 | 0.402 | 67.0 | -5 | 2.56 | -44.7 | 29.4 | 0.285 | 1.47 | 13.99 | 9507 | 0.019 | 29957. |
| LEOPOLDVILLE | -4.37 | 15.25 | 0.267 | -32.2 | -9 | 1.13 | 23.7 | 11.5 | 0.306 | 7.48 | 13.41 | 892 | 0.211 | 3700. |
| LINDAU,HARZ | 51.65 | 10.13 | 0.402 | 66.6 | -3 | 2.44 | -42.4 | 32.3 | 0.286 | 2.65 | 18.23 | 8798 | 0.022 | 27867. |
| LISBOA | 38.77 | -9.13 | 0.362 | 55.5 | -10 | 1.68 | -30.3 | 8.9 | 0.260 | 1.11 | -0.82 | 4011 | 0.066 | 14055. |
| LITTLE AMERICA | -78.18 | -162.17 | 0.527 | -80.3 | -80 | 13.93 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| LOGRONO | 42.45 | -2.50 | 0.374 | 58.7 | -8 | 1.82 | -32.7 | 15.6 | 0.266 | 1.83 | 5.46 | 4882 | 0.053 | 16597. |
| LOVOZERO | 67.99 | 35.08 | 0.448 | 77.7 | 9 | 5.41 | -55.6 | 70.5 | 0.418 | 5.52 | 46.07 | 27988 | 0.002 | 81132. |
| LONGYEARBYEN | 78.22 | 15.67 | 0.457 | 81.9 | -5 | 15.29 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| LONDON | 51.53 | 0.10 | 0.400 | 66.7 | -7 | 2.57 | -45.3 | 26.3 | 0.283 | 1.12 | 10.43 | 9491 | 0.019 | 29952. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | •• | O | R | I | G | I | N | •• CONJUGATE | INTERS. | •• MINIMUM-B | E Q U A T O R | •• ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| LOMNICKY STIT | | 49.20 | 20.22 | 0.402 | 64.5 | 0 | 2.13 | -36.8 | 36.2 | 0.287 | 4.12 | 25.46 | 6937 | 0.033 | 22423. |
| LOURENCO MARQUES | | -25.97 | 32.60 | 0.283 | -60.6 | -15 | 1.62 | 41.6 | 23.9 | 0.383 | 5.42 | 26.75 | 3881 | 0.073 | 13431. |
| LUND | | 55.70 | 13.18 | 0.413 | 69.6 | -1 | 2.90 | -47.2 | 39.3 | 0.307 | 2.69 | 22.21 | 11742 | 0.013 | 36203. |
| LUANDA | | -8.82 | 13.22 | 0.267 | -39.5 | -12 | 1.19 | 26.8 | 7.5 | 0.317 | 6.60 | 10.34 | 1216 | 0.182 | 4987. |
| LULEA | | 65.60 | 22.12 | 0.436 | 75.9 | 2 | 4.88 | -56.2 | 59.9 | 0.387 | 3.73 | 34.51 | 24493 | 0.003 | 71660. |
| LVOV | | 49.82 | 24.02 | 0.406 | 65.2 | 2 | 2.17 | -37.1 | 39.6 | 0.292 | 4.38 | 28.77 | 7177 | 0.031 | 23087. |
| LWIRO | | -2.25 | 28.80 | 0.276 | -28.5 | -3 | 1.10 | 22.3 | 27.7 | 0.313 | 8.07 | 28.15 | 772 | 0.232 | 3138. |
| LYCKSELE | | 64.62 | 18.67 | 0.433 | 75.3 | 0 | 4.66 | -56.1 | 56.5 | 0.377 | 3.40 | 31.21 | 23063 | 0.003 | 67747. |
| MAKATEA | | -16.20 | -148.20 | 0.309 | -26.9 | 12 | 1.11 | 11.4 | -143.0 | 0.287 | -1.66 | -145.33 | 828 | 0.227 | 3598. |
| MANILA | | 14.52 | 121.00 | 0.330 | 14.4 | 0 | 1.00 | 1.6 | 120.7 | 0.332 | 8.18 | 120.90 | 498 | 0.309 | 1562. |
| MALVERN | | 52.12 | -2.32 | 0.402 | 67.3 | -9 | 2.68 | -47.1 | 25.7 | 0.285 | 0.38 | 8.85 | 10182 | 0.017 | 31953. |
| MAJURO ISLAND | | 7.08 | 171.13 | 0.283 | 4.7 | 9 | 1.03 | 2.6 | 170.4 | 0.290 | 6.81 | 171.09 | 402 | 0.283 | 542. |
| MADRID | | 40.40 | -3.68 | 0.367 | 56.6 | -8 | 1.71 | -30.2 | 13.3 | 0.265 | 1.88 | 3.98 | 4226 | 0.063 | 14654. |
| MACAO | | 22.20 | 113.55 | 0.360 | 29.6 | -0 | 1.05 | -5.0 | 113.1 | 0.356 | 8.55 | 113.47 | 858 | 0.265 | 3522. |
| MADRAS | | 13.08 | 80.28 | 0.332 | 8.9 | -2 | 0.99 | 5.7 | 80.7 | 0.325 | 8.50 | 80.52 | 432 | 0.321 | 882. |
| MAWSON | | -67.40 | 62.50 | 0.434 | -71.2 | -56 | 9.54 | 71.1 | -4.7 | 0.442 | 0.65 | 20.68 | 54118 | 0.000 | 153955. |
| MACQUARIE ISLAND | | -54.30 | 158.60 | 0.540 | -79.1 | 25 | 5.54 | 67.2 | -164.9 | 0.470 | 5.58 | 175.60 | 29192 | 0.002 | 83907. |
| MARION ISLAND | | -46.85 | 37.87 | 0.303 | -65.1 | -33 | 2.84 | 55.2 | 11.9 | 0.411 | 2.53 | 21.00 | 11388 | 0.014 | 35217. |
| MAUI,KIHEI | | 20.80 | -156.50 | 0.305 | 38.2 | 11 | 1.20 | -20.4 | -164.9 | 0.349 | 1.24 | -160.32 | 1420 | 0.181 | 5939. |
| MCMURDO SOUND | | -77.85 | 166.62 | 0.539 | -83.4 | -39 | 36.04 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MEANCOK | | 54.62 | -113.33 | 0.496 | 77.4 | 22 | 4.92 | -63.0 | -157.5 | 0.516 | -5.47 | -128.60 | 25200 | 0.003 | 73181. |
| MEUDON | | 48.80 | 2.25 | 0.393 | 64.4 | -6 | 2.25 | -40.5 | 24.4 | 0.275 | 1.81 | 11.11 | 7550 | 0.028 | 24352. |
| MEMAMBETSU | | 43.92 | 144.20 | 0.410 | 57.7 | -5 | 1.59 | -26.4 | 140.5 | 0.454 | 9.24 | 143.67 | 4119 | 0.078 | 14129. |
| MEXICO EL CERRILLO | | 19.32 | -99.55 | 0.362 | 46.6 | 9 | 1.36 | -35.9 | -110.5 | 0.330 | -9.36 | -103.87 | 2332 | 0.121 | 9040. |
| MELBOURNE | | -37.82 | 144.32 | 0.505 | -69.0 | 10 | 2.40 | 55.8 | 153.6 | 0.443 | 8.79 | 150.19 | 9217 | 0.023 | 28536. |
| MIDWAY ISLAND | | 6.97 | 158.22 | 0.292 | -0.0 | 6 | 1.02 | 7.0 | 158.2 | 0.291 | 7.01 | 158.22 | 400 | 0.291 | 5. |
| MIEDZESZYN | | 52.17 | 21.20 | 0.410 | 67.1 | 1 | 2.40 | -40.7 | 40.1 | 0.297 | 3.99 | 27.19 | 8627 | 0.023 | 27271. |
| MINNEAPOLIS | | 44.97 | -93.23 | 0.488 | 73.9 | 6 | 3.47 | -64.7 | -123.4 | 0.473 | -10.63 | -99.59 | 15750 | 0.007 | 47215. |
| MIRNY | | -66.57 | 92.92 | 0.498 | -77.9 | -73 | 21.39 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MINA AGUILAR | | -23.10 | -65.70 | 0.218 | -17.0 | 1 | 1.15 | -4.1 | -66.1 | 0.253 | -16.64 | -65.66 | 557 | 0.208 | 2317. |
| MOULD BAY | | 76.20 | -119.40 | 0.492 | 87.2 | 59 | 39.08 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MOSHIRI | | 44.37 | 142.27 | 0.415 | 58.4 | -6 | 1.61 | -26.7 | 138.9 | 0.457 | 9.32 | 141.92 | 4255 | 0.075 | 14503. |
| MOCA | | 3.35 | 8.67 | 0.260 | -14.4 | -9 | 1.07 | 15.6 | 6.7 | 0.278 | 7.59 | 7.94 | 484 | 0.252 | 1492. |
| MOSCOW | | 55.47 | 37.32 | 0.432 | 70.5 | 7 | 2.68 | -42.5 | 55.7 | 0.338 | 5.52 | 41.74 | 10554 | 0.016 | 32561. |
| MOUNT WASHINGTON | | 44.27 | -71.30 | 0.472 | 73.6 | -13 | 3.58 | -72.0 | -78.9 | 0.428 | -12.72 | -67.13 | 16225 | 0.007 | 48978. |
| MOUNT NORIKURA | | 36.12 | 137.55 | 0.387 | 49.7 | -4 | 1.32 | -19.1 | 135.9 | 0.417 | 9.12 | 137.66 | 2439 | 0.135 | 9107. |
| MONT JOLI | | 48.60 | -68.20 | 0.476 | 75.7 | -19 | 4.48 | -76.3 | -71.0 | 0.440 | -12.35 | -61.66 | 21903 | 0.003 | 64845. |
| MURCHISON BAY | | 80.05 | 18.30 | 0.461 | 82.8 | -5 | 18.27 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| MURMANSK | | 68.97 | 33.08 | 0.448 | 78.1 | 8 | 5.84 | -56.8 | 71.1 | 0.423 | 5.23 | 45.32 | 30757 | 0.002 | 88826. |
| MUNCHEN | | 48.13 | 11.70 | 0.394 | 63.5 | -2 | 2.10 | -36.8 | 29.4 | 0.278 | 3.29 | 18.29 | 6668 | 0.035 | 21713. |
| NARSSARSSUAQ | | 61.18 | -45.42 | 0.456 | 77.6 | -34 | 8.03 | -78.7 | 18.5 | 0.435 | -7.86 | -25.30 | 44373 | 0.001 | 127397. |
| NARYAN MAR | | 67.50 | 53.00 | 0.463 | 78.7 | 15 | 4.95 | -52.1 | 79.7 | 0.441 | 7.53 | 60.09 | 25258 | 0.003 | 73278. |
| NATAL | | -5.33 | -35.12 | 0.226 | -2.6 | -17 | 1.12 | -2.8 | -35.9 | 0.231 | NO MINIMUM B BETWEEN | | INTERS. | | 309. |
| NAIROBI | | -1.28 | 36.80 | 0.279 | -24.8 | -1 | 1.08 | 20.1 | 36.5 | 0.314 | 7.46 | 36.52 | 676 | 0.247 | 2675. |
| NEUSTRELITZ | | 53.28 | -13.08 | 0.408 | 68.9 | -14 | 3.09 | -53.6 | 21.4 | 0.299 | -1.57 | 0.91 | 12739 | 0.011 | 39314. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** | O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| NIAMEY | | 13.50 | 2.50 | 0.270 | 10.7 | -9 | 1.07 | 4.1 | 4.3 | 0.257 | 6.91 | 3.72 | 446 | 0.253 | 1145. |
| NITSANIM | | 31.73 | 34.60 | 0.358 | 44.7 | 2 | 1.27 | -13.9 | 37.0 | 0.285 | 6.76 | 35.10 | 1802 | 0.152 | 6960. |
| NIIGATA | | 37.70 | 138.82 | 0.392 | 51.5 | -5 | 1.36 | -20.5 | 136.9 | 0.424 | 9.15 | 138.87 | 2717 | 0.123 | 9962. |
| NICOSIA | | 35.17 | 33.28 | 0.370 | 49.5 | 2 | 1.36 | -17.9 | 37.0 | 0.287 | 6.45 | 34.15 | 2366 | 0.122 | 8773. |
| NOUVELLE AMSTERDAM | | -37.84 | 77.57 | 0.408 | -67.7 | -32 | 2.44 | 54.2 | 65.6 | 0.466 | 7.93 | 67.49 | 9390 | 0.021 | 28908. |
| NOVOLAZAREVSKAYA | | -70.77 | 11.85 | 0.381 | -65.8 | -27 | 5.03 | 56.7 | -37.1 | 0.438 | -6.69 | -18.76 | 25132 | 0.002 | 74103. |
| NORD | | 81.60 | -16.67 | 0.464 | 83.8 | -35 | 40.66 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | ** | | | |
| NORWAY STATION | | -70.50 | -2.53 | 0.372 | -64.4 | -18 | 4.28 | 52.6 | -43.2 | 0.440 | -8.22 | -26.99 | 20378 | 0.004 | 60898. |
| NORFOLK ISLAND | | -29.00 | 167.60 | 0.435 | -56.4 | 14 | 1.59 | 40.9 | -179.7 | 0.359 | 6.25 | 174.46 | 3921 | 0.080 | 13768. |
| NOUMEA | | -22.30 | -166.40 | 0.361 | -41.6 | 14 | 1.24 | 23.4 | -156.9 | 0.313 | 1.46 | -161.27 | 1685 | 0.164 | 6865. |
| NURMIJARVI | | 60.50 | 24.65 | 0.429 | 73.1 | 3 | 3.55 | -50.4 | 53.3 | 0.349 | 3.81 | 33.42 | 15984 | 0.007 | 47967. |
| ODESSA | | 46.78 | 30.88 | 0.405 | 62.8 | 4 | 1.91 | -32.5 | 42.1 | 0.294 | 5.39 | 33.80 | 5675 | 0.045 | 18683. |
| O'HIGGINS RISOPATR | | -63.32 | -57.90 | 0.350 | -57.8 | 12 | 2.37 | 35.3 | -63.6 | 0.433 | -12.74 | -57.43 | 8403 | 0.023 | 27200. |
| OKINAWA | | 26.50 | 128.00 | 0.361 | 37.0 | -2 | 1.12 | -10.1 | 127.4 | 0.372 | 8.56 | 128.10 | 1225 | 0.220 | 5050. |
| OLENEK | | 68.50 | 112.40 | 0.495 | 81.5 | -4 | 4.75 | -48.1 | 115.6 | 0.528 | 10.63 | 112.38 | 24336 | 0.003 | 70165. |
| ONAGAWA | | 38.43 | 141.47 | 0.390 | 52.0 | -5 | 1.39 | -21.3 | 139.0 | 0.427 | 9.23 | 141.33 | 2844 | 0.117 | 10370. |
| OOHIRA | | 35.62 | 140.50 | 0.379 | 48.6 | -4 | 1.31 | -18.7 | 138.5 | 0.413 | 9.10 | 140.43 | 2342 | 0.139 | 8833. |
| ORCADAS DEL SUR | | -60.73 | -44.73 | 0.319 | -55.8 | 3 | 2.24 | 34.5 | -58.0 | 0.419 | -12.11 | -49.89 | 7490 | 0.028 | 24676. |
| OSLO KJELLER | | 59.97 | 11.10 | 0.421 | 72.4 | -3 | 3.67 | -53.1 | 44.5 | 0.336 | 2.12 | 22.70 | 16641 | 0.006 | 49984. |
| OTTAWA | | 45.40 | -75.75 | 0.480 | 74.7 | -10 | 3.82 | -72.1 | -91.5 | 0.446 | -12.54 | -73.76 | 17824 | 0.005 | 53331. |
| OULU | | 65.00 | 25.52 | 0.437 | 75.7 | 4 | 4.62 | -54.8 | 60.7 | 0.385 | 4.28 | 36.65 | 22835 | 0.003 | 67008. |
| PALESTINE | | 31.77 | -95.63 | 0.435 | 62.0 | 8 | 1.93 | -50.8 | -114.3 | 0.404 | -10.37 | -101.20 | 5994 | 0.042 | 19848. |
| PANSKA VES | | 50.53 | 14.57 | 0.402 | 65.6 | -1 | 2.29 | -39.7 | 33.8 | 0.285 | 3.40 | 21.32 | 7864 | 0.027 | 25146. |
| PARIS-SACLAY | | 48.12 | 2.33 | 0.391 | 63.8 | -6 | 2.19 | -39.4 | 23.7 | 0.273 | 1.94 | 10.94 | 7164 | 0.031 | 23234. |
| PARIS-BAGNEUX | | 48.80 | 2.32 | 0.393 | 64.4 | -6 | 2.25 | -40.5 | 24.4 | 0.275 | 1.82 | 11.16 | 7545 | 0.028 | 24337. |
| PANAGURITSCH | | 42.52 | 24.18 | 0.386 | 58.0 | 1 | 1.67 | -27.2 | 33.4 | 0.283 | 5.38 | 27.11 | 4154 | 0.067 | 14242. |
| PARAMARIBO | | 5.82 | -55.22 | 0.283 | 31.2 | -10 | 1.24 | -29.4 | -48.7 | 0.209 | -14.76 | -51.42 | 1026 | 0.167 | 4735. |
| PETROPAVLOVSK-ON-K | | 52.98 | 158.65 | 0.426 | 64.8 | -2 | 2.15 | -35.7 | 148.6 | 0.492 | 8.66 | 154.87 | 7651 | 0.032 | 24223. |
| PEARCE | | -31.67 | 115.97 | 0.482 | -66.1 | -2 | 1.97 | 50.3 | 114.6 | 0.479 | 9.83 | 115.54 | 6704 | 0.040 | 21195. |
| PIC DU MIDI | | 42.93 | 0.25 | 0.376 | 58.9 | -7 | 1.82 | -32.4 | 17.6 | 0.268 | 2.33 | 7.75 | 4916 | 0.052 | 16672. |
| PILAR | | -31.67 | -63.88 | 0.223 | -29.4 | 3 | 1.22 | 4.1 | -65.1 | 0.287 | -16.19 | -63.84 | 1035 | 0.171 | 4746. |
| PIWNICE -TORUN | | 50.52 | 14.57 | 0.402 | 65.6 | -1 | 2.29 | -39.7 | 33.8 | 0.285 | 3.39 | 21.32 | 7857 | 0.027 | 25123. |
| PLAISANCE | | -20.43 | 57.67 | 0.317 | -53.2 | -14 | 1.40 | 36.3 | 53.4 | 0.401 | 6.68 | 53.97 | 2730 | 0.114 | 9849. |
| POSADAS | | -27.42 | -56.10 | 0.211 | -24.5 | -3 | 1.19 | 1.4 | -59.5 | 0.269 | -16.08 | -57.27 | 793 | 0.184 | 3690. |
| PONZA | | 40.92 | 12.95 | 0.372 | 56.0 | -2 | 1.62 | -26.1 | 24.1 | 0.276 | 4.63 | 17.40 | 3802 | 0.073 | 13247. |
| PONTA DELGADO | | 37.77 | -25.65 | 0.371 | 57.7 | -16 | 1.86 | -39.1 | -1.8 | 0.250 | -3.39 | -14.58 | 4963 | 0.050 | 17097. |
| POTCHEFSTROOM | | -26.68 | 27.08 | 0.278 | -61.3 | -17 | 1.64 | 41.7 | 16.4 | 0.377 | 4.92 | 20.43 | 3969 | 0.070 | 13729. |
| POINT BARROW | | 71.33 | -156.77 | 0.481 | 80.3 | 28 | 8.59 | -59.1 | 156.1 | 0.549 | 5.17 | 176.93 | 48874 | 0.000 | 138197. |
| POTSDAM | | 52.38 | 13.07 | 0.405 | 67.1 | -1 | 2.49 | -42.7 | 35.0 | 0.290 | 2.88 | 20.81 | 9123 | 0.021 | 28769. |
| POITIERS | | 46.57 | 0.35 | 0.387 | 62.5 | -7 | 2.08 | -37.8 | 21.0 | 0.270 | 1.54 | 8.95 | 6487 | 0.035 | 21293. |
| PORT ARTHUR | | 30.00 | -94.00 | 0.427 | 60.5 | 7 | 1.84 | -49.7 | -111.2 | 0.392 | -10.56 | -99.05 | 5402 | 0.048 | 18166. |
| POONA | | 18.05 | 73.12 | 0.342 | 21.4 | -1 | 1.03 | -0.4 | 74.4 | 0.322 | 7.72 | 73.68 | 614 | 0.287 | 2292. |
| PORO POINT | | 16.62 | 120.28 | 0.336 | 18.8 | 0 | 1.01 | -0.4 | 119.9 | 0.337 | 8.18 | 120.17 | 570 | 0.299 | 2082. |
| PORT AUX FRANCAIS | | -49.35 | 70.27 | 0.402 | -69.2 | -45 | 3.89 | 63.2 | 45.6 | 0.452 | 6.46 | 51.77 | 18405 | 0.005 | 54385. |
| PORT STANLEY | | -51.70 | -57.85 | 0.283 | -48.9 | 7 | 1.69 | 23.8 | -63.0 | 0.383 | -13.83 | -58.43 | 4014 | 0.065 | 14550. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** | O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| PORT MORESBY | | -9.20 | 147.15 | 0.355 | -32.9 | 6 | 1.12 | 25.1 | 149.3 | 0.321 | 8.91 | 148.67 | 1074 | 0.223 | 4606. |
| PROVIDENIE BAY | | 64.38 | 186.60 | 0.459 | 74.1 | 13 | 4.23 | -50.3 | 157.7 | 0.531 | 6.36 | 171.62 | 20886 | 0.004 | 60975. |
| PRAHA | | 50.07 | 14.43 | 0.400 | 65.2 | -1 | 2.25 | -39.1 | 33.2 | 0.284 | 3.20 | 21.10 | 7600 | 0.028 | 24391. |
| PRUHONICE | | 49.98 | 14.55 | 0.400 | 65.1 | -1 | 2.24 | -38.9 | 33.2 | 0.284 | 3.18 | 21.17 | 7544 | 0.029 | 24227. |
| PRETORIA | | -26.80 | 28.20 | 0.279 | -61.3 | -17 | 1.65 | 41.9 | 17.8 | 0.379 | 4.84 | 21.64 | 4011 | 0.069 | 13853. |
| PRINCE ALBERT | | 53.20 | -105.70 | 0.500 | 77.9 | 17 | 4.99 | -65.5 | -149.1 | 0.511 | -7.44 | -118.43 | 25558 | 0.002 | 74249. |
| PULLMANN | | 46.72 | -117.17 | 0.473 | 70.9 | 19 | 2.99 | -55.3 | -149.6 | 0.485 | -5.12 | -129.57 | 12874 | 0.011 | 39013. |
| PUNTA ARENAS | | -53.15 | -70.90 | 0.313 | -51.4 | 16 | 1.74 | 24.7 | -69.2 | 0.397 | -14.04 | -66.86 | 4436 | 0.059 | 15710. |
| PYONGYANG | | 39.07 | 125.78 | 0.423 | 55.0 | -5 | 1.41 | -21.6 | 125.2 | 0.435 | 9.35 | 126.33 | 3067 | 0.111 | 10891. |
| QUETTA | | 30.18 | 66.95 | 0.390 | 44.9 | 0 | 1.21 | -13.5 | 70.2 | 0.337 | 7.19 | 67.73 | 1709 | 0.174 | 6578. |
| QUEEN MAUD LAND | | -70.50 | -1.00 | 0.372 | -64.5 | -19 | 4.34 | 53.0 | -42.5 | 0.439 | -8.13 | -26.09 | 20775 | 0.004 | 62005. |
| QUENTONCITY | | 19.00 | 121.00 | 0.342 | 23.6 | 0 | 1.03 | -2.7 | 120.6 | 0.344 | 8.33 | 120.91 | 681 | 0.284 | 2719. |
| QUEBEC | | 46.92 | -71.08 | 0.477 | 75.2 | -16 | 4.12 | -74.5 | -79.6 | 0.441 | -12.54 | -66.38 | 19657 | 0.004 | 58537. |
| QUILCN | | 8.50 | 76.00 | 0.322 | -1.3 | -3 | 0.99 | 9.6 | 75.9 | 0.323 | NO MINIMUM B BETWEEN | | INTERS. | | 127. |
| RABAT | | 34.02 | -6.85 | 0.344 | 49.4 | -9 | 1.45 | -22.8 | 7.0 | 0.261 | 2.59 | -0.25 | 2674 | 0.101 | 9931. |
| RAMEY AFB | | 18.50 | -67.20 | 0.363 | 51.1 | -6 | 1.51 | -46.8 | -66.9 | 0.275 | -14.71 | -64.94 | 2928 | 0.090 | 11207. |
| RAROTONGA | | -21.20 | -159.75 | 0.346 | -38.2 | 13 | 1.20 | 20.0 | -151.4 | 0.307 | 0.29 | -155.17 | 1417 | 0.181 | 5932. |
| RESOLUTE | | 74.68 | -94.92 | 0.492 | 89.2 | -36 | 96.91 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | ** | | | |
| REYKJAVIK | | 64.18 | -21.70 | 0.436 | 76.1 | -24 | 6.75 | -69.2 | 39.0 | 0.400 | -3.35 | 0.35 | 36209 | 0.001 | 104697. |
| REGENSBERG | | 47.48 | 8.45 | 0.391 | 63.0 | -3 | 2.07 | -36.7 | 26.7 | 0.276 | 2.75 | 15.56 | 6484 | 0.036 | 21209. |
| RIO DE JANEIRO | | -22.90 | -43.22 | 0.207 | -24.4 | -14 | 1.19 | 3.6 | -49.8 | 0.265 | -13.23 | -45.76 | 747 | 0.186 | 3446. |
| RIO GALLEGOS | | -51.63 | -69.22 | 0.302 | -49.9 | 14 | 1.67 | 23.2 | -68.4 | 0.388 | -14.23 | -65.95 | 4004 | 0.066 | 14447. |
| ROYAL ROADS | | 48.50 | -123.50 | 0.470 | 70.9 | 21 | 3.05 | -54.0 | -156.7 | 0.490 | -3.77 | -137.13 | 13241 | 0.011 | 40013. |
| ROMA | | 41.88 | 12.50 | 0.375 | 57.1 | -2 | 1.67 | -27.6 | 24.5 | 0.276 | 4.38 | 17.26 | 4108 | 0.067 | 14171. |
| ROSTOV/DON | | 47.23 | 39.65 | 0.417 | 64.0 | 6 | 1.93 | -32.7 | 50.0 | 0.310 | 5.99 | 41.73 | 5861 | 0.044 | 19160. |
| SANTA CRUZ | | -17.80 | -63.17 | 0.218 | -7.9 | -1 | 1.13 | -9.2 | -63.6 | 0.234 | -17.13 | -63.19 | 410 | 0.218 | 1026. |
| SAN FERNANDO | | 36.47 | -6.20 | 0.353 | 52.4 | -9 | 1.54 | -25.7 | 9.0 | 0.262 | 2.25 | 0.90 | 3216 | 0.085 | 11609. |
| SANTA CRUZ | | 28.33 | -16.25 | 0.325 | 44.0 | -12 | 1.35 | -20.5 | -2.5 | 0.248 | 0.92 | -9.38 | 1999 | 0.125 | 7857. |
| SANTIAGO | | -33.57 | -70.72 | 0.238 | -32.6 | 8 | 1.24 | 6.1 | -69.6 | 0.301 | -15.56 | -69.32 | 1216 | 0.164 | 5418. |
| SALEKHARD | | 66.58 | 66.67 | 0.475 | 79.4 | 16 | 4.55 | -49.5 | 87.0 | 0.461 | 8.49 | 71.41 | 22806 | 0.003 | 66275. |
| SASKATOON | | 52.13 | -106.67 | 0.498 | 77.0 | 17 | 4.59 | -64.2 | -148.2 | 0.508 | -7.53 | -119.31 | 23032 | 0.003 | 67246. |
| SAPPORO | | 43.02 | 121.35 | 0.447 | 60.1 | -5 | 1.56 | -25.1 | 121.3 | 0.454 | 9.48 | 122.07 | 4048 | 0.081 | 13713. |
| SACRAMENTO PEAK | | 32.72 | -105.75 | 0.429 | 60.8 | 12 | 1.87 | -47.4 | -125.5 | 0.413 | -8.18 | -112.89 | 5645 | 0.047 | 18798. |
| SAN JUAN | | 18.43 | -66.00 | 0.361 | 50.8 | -6 | 1.51 | -46.7 | -64.5 | 0.270 | -14.56 | -63.33 | 2899 | 0.091 | 11132. |
| SAN JULIAN | | -49.32 | -67.78 | 0.288 | -47.8 | 13 | 1.59 | 20.9 | -67.7 | 0.376 | -14.45 | -65.27 | 3443 | 0.077 | 12776. |
| SAO PAULO | | -23.55 | -46.63 | 0.206 | -23.2 | -11 | 1.18 | 2.0 | -52.3 | 0.263 | -14.27 | -48.74 | 715 | 0.188 | 3293. |
| SAO JOSE DOS CAMPO | | -23.00 | -46.00 | 0.206 | -22.8 | -12 | 1.18 | 2.0 | -51.7 | 0.261 | -14.21 | -48.08 | 697 | 0.189 | 3208. |
| SALISBURY RHOD-NYA | | -17.83 | 31.00 | 0.283 | -53.3 | -10 | 1.37 | 35.4 | 26.2 | 0.363 | 6.32 | 27.75 | 2382 | 0.120 | 8839. |
| SCHWARZENBURG | | 46.83 | 7.33 | 0.389 | 62.4 | -4 | 2.03 | -36.0 | 25.4 | 0.274 | 2.77 | 14.46 | 6223 | 0.038 | 20455. |
| SCOTT BASE | | -77.85 | 166.75 | 0.539 | -83.4 | -39 | 36.13 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D | ** | | | |
| SENDAI | | 38.10 | 140.55 | 0.390 | 51.7 | -5 | 1.38 | -20.9 | 138.3 | 0.426 | 9.07 | 140.47 | 2785 | 0.120 | 10182. |
| SEOUL | | 37.58 | 127.05 | 0.414 | 53.0 | -5 | 1.36 | -20.2 | 126.4 | 0.427 | 9.11 | 127.54 | 2760 | 0.123 | 9988. |
| SEATTLE | | 47.75 | -122.42 | 0.469 | 70.6 | 21 | 2.98 | -53.9 | -155.0 | 0.488 | -3.85 | -135.63 | 12767 | 0.012 | 38698. |
| SEMIPALATINSK | | 50.40 | 80.25 | 0.476 | 69.3 | 4 | 2.05 | -32.7 | 87.9 | 0.433 | 8.82 | 81.51 | 7121 | 0.035 | 22371. |
| SEAGROVE | | -37.08 | 174.78 | 0.462 | -63.0 | 17 | 1.96 | 46.1 | -166.1 | 0.392 | 4.52 | -175.32 | 6280 | 0.042 | 20542. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | ** ARC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| SHEPHERD BAY | 68.75 | -93.75 | 0.499 | 87.4 | -5 | 29.92 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| SHIRAZ | 29.63 | 52.52 | 0.373 | 43.8 | 2 | 1.22 | -13.6 | 54.8 | 0.304 | 6.47 | 52.84 | 1652 | 0.169 | 6443. |
| SHACKLETON | -77.98 | -37.17 | 0.426 | -67.6 | 4 | 5.06 | 51.9 | -58.9 | 0.466 | -10.87 | -47.15 | 25505 | 0.002 | 75019. |
| SHEFFIELD | 53.43 | 1.35 | 0.405 | 68.1 | -7 | 2.78 | -47.6 | 29.4 | 0.291 | 0.89 | 12.20 | 10843 | 0.015 | 33792. |
| SIMOSATO | 33.58 | 135.94 | 0.379 | 46.6 | -4 | 1.26 | -16.7 | 134.6 | 0.404 | 9.04 | 136.09 | 2043 | 0.157 | 7862. |
| SIOMCUTH | 50.68 | 3.22 | 0.398 | 65.9 | -6 | 2.43 | -43.0 | 27.0 | 0.280 | 1.53 | 12.56 | 8633 | 0.023 | 27465. |
| SITKA | 57.05 | -135.33 | 0.475 | 74.3 | 27 | 4.16 | -55.8 | -175.0 | 0.517 | -0.37 | -153.25 | 20399 | 0.004 | 59790. |
| SIMFEROPOL | 44.83 | 34.07 | 0.404 | 61.2 | 4 | 1.78 | -29.9 | 43.2 | 0.295 | 5.75 | 36.22 | 4921 | 0.055 | 16459. |
| SINGAPORE | 1.32 | 103.82 | 0.340 | -18.1 | 1 | 1.00 | 17.1 | 104.0 | 0.347 | 8.90 | 103.92 | 554 | 0.309 | 1931. |
| SLOUGH | 51.48 | -0.57 | 0.400 | 66.7 | -8 | 2.57 | -45.5 | 25.8 | 0.282 | 1.02 | 9.89 | 9520 | 0.019 | 30040. |
| SODANKYLA | 67.37 | 26.65 | 0.442 | 77.0 | 4 | 5.38 | -56.7 | 65.2 | 0.405 | 4.41 | 39.21 | 27723 | 0.002 | 80535. |
| SOUTH POLE | -90.00 | 0. | 0.494 | -75.8 | -29 | 14.88 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| SREDNIKAN | 62.43 | 152.32 | 0.465 | 73.2 | -5 | 3.27 | -43.7 | 140.9 | 0.527 | 9.20 | 147.33 | 14858 | 0.009 | 44137. |
| ST. STEPHEN | 67.20 | -45.20 | 0.461 | 80.1 | -40 | 14.17 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| STELLENBOSCH | -33.94 | 18.85 | 0.269 | -63.7 | -24 | 1.89 | 44.1 | 0.7 | 0.379 | 2.08 | 8.43 | 5346 | 0.047 | 17943. |
| STOCKHOLM | 59.30 | 18.10 | 0.423 | 72.1 | 0 | 3.42 | -50.5 | 47.5 | 0.334 | 3.05 | 27.71 | 15058 | 0.008 | 45464. |
| STONYHURST | 53.51 | -2.47 | 0.405 | 68.4 | -9 | 2.86 | -49.2 | 27.4 | 0.292 | 0.51 | 9.25 | 11351 | 0.014 | 35269. |
| ST. LAWRENCE | 50.58 | 1.23 | 0.398 | 65.9 | -7 | 2.45 | -43.5 | 25.8 | 0.279 | 1.27 | 10.98 | 8729 | 0.022 | 27760. |
| STANLEY | -51.70 | -57.85 | 0.283 | -48.9 | 7 | 1.69 | 23.8 | -63.0 | 0.383 | -13.83 | -58.43 | 4014 | 0.065 | 14550. |
| ST. SANTIN-DE-MAUR | 44.60 | 20.20 | 0.389 | 60.1 | 0 | 1.80 | -30.3 | 32.0 | 0.281 | 4.74 | 24.22 | 4907 | 0.054 | 16499. |
| ST. MICHEL | 43.92 | 5.72 | 0.379 | 59.6 | -5 | 1.84 | -32.1 | 21.8 | 0.272 | 2.96 | 12.36 | 5042 | 0.051 | 17000. |
| STANFORD | 37.43 | -122.17 | 0.428 | 62.0 | 16 | 1.97 | -45.3 | -144.5 | 0.438 | -4.39 | -131.52 | 6303 | 0.040 | 20630. |
| ST. JOHNS | 47.52 | -52.78 | 0.447 | 71.9 | -24 | 3.68 | -71.2 | -25.9 | 0.376 | -10.48 | -40.14 | 16634 | 0.006 | 50425. |
| SUKKERTOPPEN | 65.42 | -52.90 | 0.469 | 80.5 | -41 | 13.98 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| SULPHUR MOUNTAIN | 51.10 | -115.60 | 0.487 | 74.5 | 21 | 3.84 | -59.4 | -153.9 | 0.503 | -5.36 | -129.64 | 18292 | 0.005 | 54048. |
| SURLARI | 44.68 | 26.25 | 0.395 | 60.4 | 2 | 1.79 | -30.0 | 36.6 | 0.286 | 5.16 | 29.35 | 4877 | 0.055 | 16377. |
| SVERDLOVSK | 56.73 | 61.07 | 0.464 | 73.3 | 10 | 2.74 | -40.9 | 75.6 | 0.405 | 7.71 | 63.58 | 11245 | 0.015 | 34175. |
| SWANSEA | 51.63 | -4.00 | 0.401 | 67.0 | -9 | 2.65 | -47.1 | 24.1 | 0.283 | 0.37 | 7.31 | 9994 | 0.017 | 31430. |
| SWARTHMORE | 39.90 | -75.35 | 0.465 | 71.0 | -7 | 2.92 | -67.1 | -87.2 | 0.418 | -12.78 | -73.76 | 12069 | 0.012 | 37282. |
| SYDNEY | -33.60 | 151.10 | 0.480 | -64.1 | 11 | 1.97 | 50.3 | 161.0 | 0.412 | 8.29 | 157.23 | 6428 | 0.042 | 20819. |
| SYKTYVKAR | 61.70 | 50.80 | 0.456 | 75.5 | 12 | 3.55 | -47.1 | 72.1 | 0.404 | 7.01 | 55.62 | 16251 | 0.007 | 48308. |
| SYOWA BASE | -69.03 | 39.60 | 0.400 | -68.1 | -43 | 6.76 | 64.3 | -21.1 | 0.436 | -2.89 | 0.94 | 36261 | 0.001 | 104333. |
| TAMALE | 9.42 | -0.89 | 0.260 | 3.1 | -11 | 1.07 | 6.7 | -0.3 | 0.256 | NO MINIMUM B BETWEEN INTERS. | | | | 332. |
| TASHKENT | 41.42 | 69.20 | 0.439 | 60.0 | 3 | 1.56 | -24.6 | 75.1 | 0.375 | 7.81 | 70.13 | 3902 | 0.081 | 13236. |
| TAMANRASSET | 22.80 | 5.52 | 0.301 | 29.0 | -6 | 1.13 | -4.7 | 10.2 | 0.262 | 6.84 | 7.96 | 871 | 0.210 | 3625. |
| TAIPEI | 25.03 | 121.52 | 0.364 | 34.9 | -1 | 1.10 | -8.5 | 121.0 | 0.367 | 8.54 | 121.55 | 1094 | 0.236 | 4521. |
| TALARA | -4.57 | -81.25 | 0.259 | 13.5 | 6 | 1.10 | -18.3 | -83.0 | 0.239 | -13.51 | -82.26 | 489 | 0.232 | 1666. |
| TANANARIVE | -18.92 | 47.55 | 0.297 | -52.2 | -10 | 1.37 | 35.2 | 44.2 | 0.384 | 6.48 | 44.57 | 2466 | 0.121 | 9065. |
| TAHITI | -17.48 | -149.48 | 0.315 | -29.5 | 12 | 1.13 | 13.1 | -143.7 | 0.291 | -1.38 | -146.25 | 930 | 0.218 | 4053. |
| TBILISI | 41.72 | 44.82 | 0.408 | 58.9 | 5 | 1.62 | -26.2 | 51.2 | 0.308 | 6.45 | 45.78 | 3984 | 0.074 | 13645. |
| TENIENTE MATIENZO | -64.97 | -60.05 | 0.363 | -59.2 | 14 | 2.52 | 36.8 | -64.5 | 0.440 | -12.82 | -58.47 | 9362 | 0.019 | 29898. |
| TEHRAN | 35.68 | 51.42 | 0.396 | 52.3 | 4 | 1.38 | -19.8 | 55.3 | 0.311 | 6.65 | 51.89 | 2608 | 0.118 | 9482. |
| TENERIFE | 28.00 | -17.00 | 0.324 | 43.7 | -12 | 1.35 | -20.6 | -3.2 | 0.247 | 0.61 | -10.06 | 1975 | 0.126 | 7792. |
| TEOLCYUCAN | 19.75 | -99.18 | 0.365 | 47.3 | 9 | 1.38 | -36.5 | -110.4 | 0.332 | -9.36 | -103.53 | 2421 | 0.117 | 9319. |
| THULE | 76.55 | -68.83 | 0.480 | 86.0 | -70 | 192.86 | ** N O | C O M P U T A T I O N S | P E R F O R M E D ** | | | | | |
| THE PAS | 53.80 | -101.30 | 0.503 | 79.0 | 13 | 5.51 | -68.0 | -146.2 | 0.512 | -8.54 | -112.75 | 28834 | 0.002 | 83372. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O | R | I | G | I | N | ** CONJUGATE | INTERS. | ** MINIMUM-B | E Q U A T O R | | ** ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| TIHANY | 46.89 | 17.89 | 0.394 | 62.4 | -0 | 1.96 | -33.9 | 32.3 | 0.281 | 4.11 | 22.91 | 5883 | 0.042 | 19380. |
| TIXIE BAY | 71.55 | 128.90 | 0.490 | 81.8 | -7 | 5.75 | -50.7 | 124.4 | 0.541 | 10.77 | 125.17 | 30679 | 0.002 | 87712. |
| TIRUCHIRAPALLI | 10.83 | 78.83 | 0.327 | 3.7 | -2 | 0.99 | 7.7 | 79.0 | 0.324 | 8.38 | 78.98 | 404 | 0.324 | 369. |
| TORINO | 45.20 | 7.65 | 0.384 | 60.8 | -4 | 1.91 | -33.5 | 24.1 | 0.273 | 3.24 | 14.21 | 5481 | 0.046 | 18277. |
| TOTTORI | 35.53 | 134.22 | 0.391 | 49.4 | -4 | 1.30 | -18.5 | 133.0 | 0.415 | 9.10 | 134.47 | 2356 | 0.140 | 8824. |
| TORUN | 53.08 | 18.55 | 0.410 | 67.7 | 0 | 2.52 | -42.5 | 39.4 | 0.298 | 3.36 | 25.42 | 9339 | 0.020 | 29332. |
| TOMSK | 56.47 | 84.93 | 0.489 | 74.5 | 5 | 2.62 | -38.3 | 93.9 | 0.463 | 9.16 | 86.55 | 10711 | 0.017 | 32421. |
| TORRE CHIARUCCIA | 42.03 | 11.83 | 0.376 | 57.3 | -2 | 1.68 | -27.9 | 24.2 | 0.276 | 4.09 | 16.78 | 4171 | 0.065 | 14367. |
| TORTOSA | 40.82 | 0.50 | 0.368 | 56.6 | -7 | 1.69 | -29.2 | 16.1 | 0.268 | 2.83 | 7.36 | 4165 | 0.064 | 14427. |
| TOLEDO | 39.88 | -4.05 | 0.365 | 56.1 | -8 | 1.68 | -29.6 | 12.7 | 0.265 | 1.94 | 3.54 | 4078 | 0.065 | 14212. |
| TOYOKAWA | 35.83 | 137.37 | 0.386 | 49.4 | -4 | 1.31 | -18.8 | 135.8 | 0.415 | 9.16 | 137.49 | 2391 | 0.138 | 8957. |
| TONANZINTLA | 19.03 | -98.30 | 0.362 | 46.6 | 9 | 1.36 | -36.1 | -109.1 | 0.327 | -9.43 | -102.49 | 2321 | 0.121 | 9005. |
| TOWNSVILLE | -19.10 | 146.50 | 0.409 | -48.1 | 7 | 1.32 | 35.7 | 150.2 | 0.361 | 8.80 | 149.24 | 2337 | 0.137 | 8892. |
| TRUJILLO | -8.10 | -79.03 | 0.248 | 7.5 | 5 | 1.10 | -15.7 | -79.9 | 0.237 | -14.19 | -79.68 | 419 | 0.236 | 914. |
| TROMSO | 69.67 | 18.95 | 0.442 | 77.9 | 0 | 6.66 | -60.3 | 66.1 | 0.419 | 3.56 | 35.58 | 35923 | 0.001 | 103338. |
| TRELEW | -43.20 | -65.30 | 0.257 | -42.1 | 9 | 1.42 | 15.0 | -66.3 | 0.344 | -15.03 | -64.19 | 2307 | 0.110 | 9258. |
| TRIVANDRUM | 8.42 | 76.95 | 0.323 | -1.7 | -3 | 0.99 | 9.8 | 76.9 | 0.324 | NO MINIMUM B BETWEEN | | INTERS. | | 165. |
| TRINIDAD | 10.60 | -61.20 | 0.315 | 40.2 | -8 | 1.33 | -37.6 | -56.6 | 0.227 | -15.28 | -58.07 | 1621 | 0.136 | 6996. |
| TSCHOIBALSAN | 48.07 | 114.50 | 0.473 | 66.1 | -5 | 1.82 | -29.6 | 115.7 | 0.473 | 9.63 | 115.42 | 5759 | 0.051 | 18531. |
| TSUMEB | -19.23 | 17.72 | 0.273 | -54.4 | -15 | 1.40 | 35.3 | 8.5 | 0.350 | 5.28 | 12.59 | 2484 | 0.111 | 9223. |
| TUBINGEN | 48.53 | 9.07 | 0.394 | 63.9 | -3 | 2.16 | -38.1 | 28.1 | 0.277 | 2.83 | 16.35 | 6993 | 0.032 | 22681. |
| TUCSON | 32.23 | -110.95 | 0.420 | 59.2 | 13 | 1.78 | -44.9 | -130.0 | 0.410 | -6.87 | -118.33 | 5105 | 0.054 | 17240. |
| TUCSON | 32.23 | -110.95 | 0.420 | 59.2 | 13 | 1.78 | -44.9 | -130.0 | 0.410 | -6.87 | -118.33 | 5105 | 0.054 | 17240. |
| TUCUMAN | -26.90 | -65.40 | 0.219 | -22.9 | 2 | 1.17 | -0.5 | -66.0 | 0.267 | -16.47 | -65.29 | 729 | 0.194 | 3328. |
| UJI | 34.90 | 135.78 | 0.385 | 48.4 | -4 | 1.29 | -17.9 | 134.4 | 0.411 | 9.08 | 135.96 | 2246 | 0.146 | 8496. |
| ULAN BATOR | 47.78 | 106.75 | 0.477 | 66.4 | -3 | 1.82 | -29.3 | 109.1 | 0.466 | 9.54 | 107.73 | 5718 | 0.051 | 18375. |
| UNALASKA | 53.88 | -166.53 | 0.425 | 66.7 | 15 | 2.59 | -43.2 | 169.7 | 0.495 | 4.94 | -178.16 | 10334 | 0.018 | 31868. |
| UNIVERSITY PARK | 40.80 | -77.77 | 0.470 | 71.7 | -6 | 3.03 | -67.2 | -93.1 | 0.429 | -12.60 | -77.25 | 12826 | 0.011 | 39348. |
| UPPSALA | 59.80 | 17.60 | 0.423 | 72.4 | 0 | 3.52 | -51.2 | 48.0 | 0.338 | 3.16 | 27.54 | 15707 | 0.007 | 47286. |
| USHUAIA | -54.80 | -68.30 | 0.317 | -52.3 | 15 | 1.81 | 26.3 | -67.9 | 0.403 | -13.88 | -64.88 | 4883 | 0.052 | 17041. |
| UTSJOKI | 69.75 | 27.03 | 0.446 | 78.2 | 4 | 6.38 | -58.6 | 69.6 | 0.424 | 4.86 | 41.45 | 34141 | 0.001 | 98283. |
| VALENTIA | 51.94 | -10.25 | 0.403 | 67.7 | -13 | 2.82 | -50.3 | 21.2 | 0.288 | -0.98 | 2.60 | 11053 | 0.014 | 34513. |
| VERKHOYANSK | 67.60 | 133.40 | 0.487 | 79.0 | -9 | 4.40 | -47.3 | 127.9 | 0.537 | 10.46 | 130.33 | 22081 | 0.004 | 63971. |
| VAL D'OR | 48.00 | -77.80 | 0.487 | 76.5 | -10 | 4.43 | -73.9 | -99.2 | 0.463 | -12.32 | -76.67 | 21705 | 0.004 | 64072. |
| VICTORIA | 48.40 | -123.40 | 0.469 | 70.9 | 21 | 3.04 | -54.0 | -156.5 | 0.490 | -3.83 | -136.98 | 13167 | 0.011 | 39809. |
| VLADIVOSTOK | 43.78 | 132.03 | 0.432 | 59.4 | -7 | 1.58 | -25.9 | 130.6 | 0.457 | 9.50 | 132.45 | 4168 | 0.078 | 14155. |
| VOSTOK | -76.48 | 106.50 | 0.518 | -80.3 | 70 | 123.06 | ** N O | C O M P U T A T I O N S | | P E R F O R M E D ** | | | | |
| WATHEROO | -30.32 | 115.88 | 0.477 | -64.8 | -2 | 1.87 | 48.9 | 114.6 | 0.475 | 9.70 | 115.56 | 6075 | 0.047 | 19425. |
| WAKKANAI | 45.40 | 141.68 | 0.421 | 59.6 | -6 | 1.66 | -27.6 | 138.3 | 0.463 | 9.35 | 141.34 | 4564 | 0.069 | 15380. |
| WASHINGTON | 38.73 | -77.13 | 0.463 | 70.2 | -5 | 2.77 | -65.4 | -90.6 | 0.416 | -12.77 | -76.51 | 11133 | 0.014 | 34621. |
| WALTAIR | 17.57 | 83.30 | 0.346 | 18.8 | -1 | 1.01 | 1.5 | 84.1 | 0.332 | 8.73 | 83.67 | 562 | 0.303 | 1970. |
| WELLEN | 66.17 | -169.84 | 0.465 | 75.6 | 16 | 4.90 | -52.4 | 157.6 | 0.536 | 5.89 | 172.89 | 25192 | 0.003 | 72858. |
| WESTFORD | 42.58 | -71.42 | 0.468 | 72.5 | -12 | 3.30 | -70.4 | -78.6 | 0.420 | -12.61 | -67.56 | 14407 | 0.009 | 43904. |
| WEISSENAU | 47.80 | 9.50 | 0.392 | 63.2 | -3 | 2.09 | -36.9 | 27.7 | 0.277 | 2.99 | 16.46 | 6596 | 0.035 | 21523. |
| WELLINGTON | -41.28 | 174.77 | 0.483 | -66.7 | 19 | 2.29 | 50.1 | -162.6 | 0.413 | 4.06 | -173.61 | 8400 | 0.026 | 26496. |

Table 4

Tracings 400 Km Above Stations

| STATIONS | ** O R I G I N ** | | | | | | ** CONJUGATE INTERS. ** | | | MINIMUM-B E Q U A T O R ** | | | | ARC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAT. | LONG. | B | DIP | DECL. | L | LAT. | LONG. | B | LAT. | LONG. | ALT. | B | KM |
| WHITE SANDS | 32.40 | -106.87 | 0.426 | 60.2 | 12 | 1.84 | -46.7 | -126.3 | 0.411 | -7.88 | -114.03 | 5441 | 0.049 | 18214. |
| WINGST | 53.75 | 9.07 | 0.407 | 68.2 | -3 | 2.70 | -45.6 | 34.3 | 0.294 | 2.24 | 18.22 | 10403 | 0.016 | 32457. |
| WITTEVEEN | 52.82 | 6.67 | 0.404 | 67.5 | -4 | 2.62 | -45.0 | 31.6 | 0.289 | 1.99 | 16.00 | 9870 | 0.018 | 30966. |
| WIESE ISLAND | 79.83 | 76.98 | 0.477 | 85.0 | 21 | 12.30 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| WINNIPEG | 49.90 | -97.40 | 0.498 | 77.0 | 9 | 4.44 | -66.9 | -135.4 | 0.497 | -9.57 | -106.21 | 22003 | 0.003 | 64512. |
| WIEN KOBENZL | 48.27 | 16.32 | 0.397 | 63.6 | -0 | 2.08 | -36.1 | 32.6 | 0.282 | 3.78 | 22.03 | 6573 | 0.036 | 21401. |
| WILKES | -66.20 | 110.35 | 0.529 | -82.5 | -81 | 36.85 | ** N O C O M P U T A T I O N S P E R F O R M E D ** | | | | | | | |
| WOOMERA | -30.70 | 136.80 | 0.479 | -63.1 | 6 | 1.84 | 48.8 | 140.4 | 0.437 | 9.41 | 139.98 | 5750 | 0.050 | 18733. |
| WROCLAW | 51.10 | 17.08 | 0.404 | 66.1 | -0 | 2.32 | -40.0 | 36.1 | 0.289 | 3.52 | 23.53 | 8104 | 0.025 | 25814. |
| WRANGEL ISLAND | 71.00 | -178.50 | 0.475 | 78.8 | 13 | 6.52 | -54.7 | 148.8 | 0.547 | 7.21 | 162.83 | 35589 | 0.001 | 101462. |
| YAKUTSK | 62.05 | 129.67 | 0.486 | 75.7 | -10 | 3.21 | -42.3 | 126.9 | 0.525 | 10.12 | 128.70 | 14557 | 0.009 | 43147. |
| YAMAGAWA | 31.20 | 130.65 | 0.378 | 44.0 | -3 | 1.20 | -14.5 | 129.8 | 0.394 | 8.87 | 130.88 | 1738 | 0.178 | 6836. |
| YELLOWKNIFE | 62.40 | -114.40 | 0.502 | 81.8 | 29 | 8.80 | -67.4 | -172.9 | 0.537 | -4.62 | -134.94 | 49956 | 0.000 | 141554. |
| YUZHNO-SAKHALINSK | 46.95 | 142.72 | 0.425 | 61.0 | -7 | 1.73 | -29.1 | 138.9 | 0.470 | 9.24 | 142.17 | 5057 | 0.060 | 16794. |
| ZARIA | 11.15 | 7.65 | 0.268 | 3.6 | -8 | 1.06 | 8.0 | 8.1 | 0.264 | NO MINIMUM B BETWEEN INTERS. | | | | 372. |
| ZUGSPITZE | 47.42 | 10.98 | 0.392 | 62.9 | -2 | 2.05 | -36.0 | 28.2 | 0.277 | 3.32 | 17.50 | 6346 | 0.037 | 20783. |

Table 5
Conjugate Pairs (with $1.1 \leq L \leq 12.$)

| North | | South | Average $\overline{L}$ | $\frac{\Delta L}{\overline{L}}\%$ | $\Delta\varphi_0$ |
|---|---|---|---|---|---|
| Great Whale River | - | Byrd Station | 7.12 | 3.6 | 1.85° |
| Reykjavik | - | Syowa Base | 6.22 | 1.9 | 0.27 |
| Kotzebue | - | MacQuarie | 5.23 | 1.1 | 1.85 |
| Farewell | - | Campbell Island | 4.17 | 6.0 | 0.26 |
| Quebec | - | Eights Station | 3.92 | 0.2 | 1.81 |
| Lund | - | Marion Island | 2.73 | 0.7 | 1.15 |
| Unalaska | - | Christchurch | 2.41 | 0.3 | 3.57 |
| Bermuda | - | Decepcion | 2.10 | 5.6 | 0.36 |
| Petropavlovsk | - | Canberra | 2.00 | 1.6 | 0.10 |
| Castel Tesino | - | Grahamstown | 1.83 | 1.6 | 0.41 |
| Aire Sur L'Adour | - | Capetown | 1.79 | 4.5 | 0.17 |
| Tschoibalsan | - | Watheroo | 1.74 | 1.8 | 0.02 |

Table 5 (Continued)

| North | | South | Average $\overline{L}$ | $\frac{\Delta L}{\overline{L}}\%$ | $\Delta\varphi_0$ |
|---|---|---|---|---|---|
| Khabarovsk | - | Woomera | 1.73 | 0.1 | 4.29 |
| Beograd | - | Durban | 1.70 | 0.8 | 0.63 |
| Panaguritsch | - | Lourenço Marques | 1.58 | 0.1 | 0.21 |
| L'Aquila | - | Potschefstroom | 1.58 | 0.3 | 2.77 |
| Ramey AFB | - | San Julian | 1.46 | 3.9 | 0.07 |
| Ashkabad | - | Plaisance | 1.35 | 3.6 | 1.40 |
| Athens | - | Salisbury (Rhod.) | 1.33 | 3.9 | 2.46 |
| Sendai | - | Cloncurry | 1.29 | 1.2 | 2.00 |
| Baghdad | - | Tananarive | 1.26 | 5.0 | 0.47 |
| Honolulu | - | Noumea | 1.15 | 2.3 | 0.60 |

Table 6

Stations with Conjugate Areas in the Antarctica ($L \leq 12.$)

| Station | L | Conjugate Area |
|---|---|---|
| Kap Tobin | 10.94 | Enderby Land |
| Barter Island | 9.05 | Ocean Station (South Pacific Ocean) |
| Fort Chimo | 8.40 | South Polar Plateau |
| Cape Jones | 6.58 | Near Byrd Station |
| Knob Lake | 6.35 | Edith Ronne Land |
| Narssarssuaq | 7.50 | Queen Maud Land |
| Julianehaab | 7.31 | Queen Maud Land |
| Goose Bay | 5.33 | Edith Ronne Land |
| Mont Joli | 4.26 | Ellsworth Highland |
| Val D'Or | 4.22 | Mary Byrd Land |
| Caribou | 3.86 | Near Eights Station |
| Deep River | 3.78 | Mary Byrd Land |
| Fort Monmouth | 2.82 | Peter I Island |

Table 7
Conjugate Areas for Stations with $1.1 \leq L \leq 12$.

| Station | L | Conjugate Area | Country |
|---|---|---|---|
| Adelaide | 2.03 | Piltun (near Okha, Sakhalin) | USSR |
| Akita | 1.35 | Rockborough Downs (Queensland) | Australia |
| Akrotiri | 1.25 | Mlanje | Nyassaland |
| Arcetri | 1.67 | Plooysburg (near Kimberley) | RSA |
| Aso | 1.17 | Victoria River Downs (Northern Territory) | Australia |
| Bologna | 1.71 | Reebokraut (Orange Free State) | RSA |
| Buenos Aires | 1.20 | Santa Barbara (Bolivar) | Venezuela |
| Capri | 1.49 | Lutlhe (Bechuanaland) | RSA |
| Catania | 1.36 | Massubia (Bechuanaland) | RSA |
| Chita | 2.00 | Wonnerup (Western Australia) | Australia |
| Chamical | 1.14 | Capibara (Amazonas) | Venezuela |
| Cocos Island | 1.11 | Garme (Chamdo) | Tibet |
| Concepcion | 1.21 | San Carlos de Zulia | Venezuela |
| Cordoba | 1.15 | Piedra Lais (Amazonas) | Venezuela |
| Corinaldo | 1.65 | Boshof (Orange Free State) | RSA |
| Cook | 1.74 | Birakan (near Birobidzhan) | USSR |
| Curacao | 1.27 | San Carlos de Bariloche | Argentina |

Table 7 (Continued)

| Station | L | Conjugate Area | Country |
|---|---|---|---|
| Dodaira | 1.24 | Near Alexandria (Northern Territory) | Australia |
| Elizabethville | 1.18 | Near Tobruk | Lybia |
| General Belgrano | 4.59 | Mecatina River (Prov. of Quebec) | Canada |
| Genova | 1.73 | Britstown | RSA |
| Gifu | 1.23 | Near Tennant Creek (Northern Territory) | Australia |
| Hachijojima | 1.18 | Near Burketown (Queensland) | Australia |
| Haifa | 1.21 | Metarica | Mozambique |
| Halley Bay | 4.17 | Williamsport (Newfoundland) | Canada |
| Helwan | 1.14 | Isoka | Northern Rhodesia |
| Hermanus | 1.85 | Riberac (Near Perigueux) | France |
| Highcliff | 2.74 | Near Fort Randall (Alaska) | USA |
| Hiraiso | 1.25 | Near Camooweal (Queensland) | Australia |
| I. Crozet | 2.88 | Pskov (Novgorod) | USSR |
| Il. Qortin | 1.31 | N'rinquinha | Angola |
| Johannesburg | 1.57 | Dubrovnik | Yugoslavia |
| Jungfraujoch | 1.87 | Humansdorp (Near Port Elizabeth) | RSA |
| Kanoya | 1.14 | Auvergne (Northern Territory) | Australia |

Table 7 (Continued)

| Station | L | Conjugate Area | Country |
|---|---|---|---|
| Kakioka, Komuro, Kokubunji | 1.25 | Near Camooweal (Queensland) | Australia |
| Kyoto | 1.22 | Tennant Creek (Northern Territory) | Australia |
| La Crau | 1.66 | Kenhardt | RSA |
| La Maddalena | 1.54 | Khokowe | Bechuanaland |
| La Plata | 1.20 | Near El Callao | Venezuela |
| Luanda | 1.13 | Tilmas | Algeria |
| Mawson | 8.63 | Near St. Mayen Island | Norway |
| Memambetsu | 1.50 | Great Victoria Deserts (South Australia) | Australia |
| Moshiri | 1.52 | Clifton Hills (Queensland) | Australia |
| Mount Norikura | 1.24 | Alroy Downs (Northern Territory) | Australia |
| Nicosia | 1.27 | Zambezia | Mozambique |
| Niigata | 1.29 | Austral Downs (Northern Territory) | Australia |
| Nitsanim | 1.18 | Near Vila Cabral | Mozambique |
| Nouvelle Amsterdam | 2.32 | Demyanovka (Kazakhstan) | USSR |
| Onagawa | 1.31 | Butru (Queensland) | Australia |
| Oohira | 1.23 | Near Camooweal (Queensland) | Australia |
| Paramaribo | 1.18 | Near Florianopolis | Brazil |

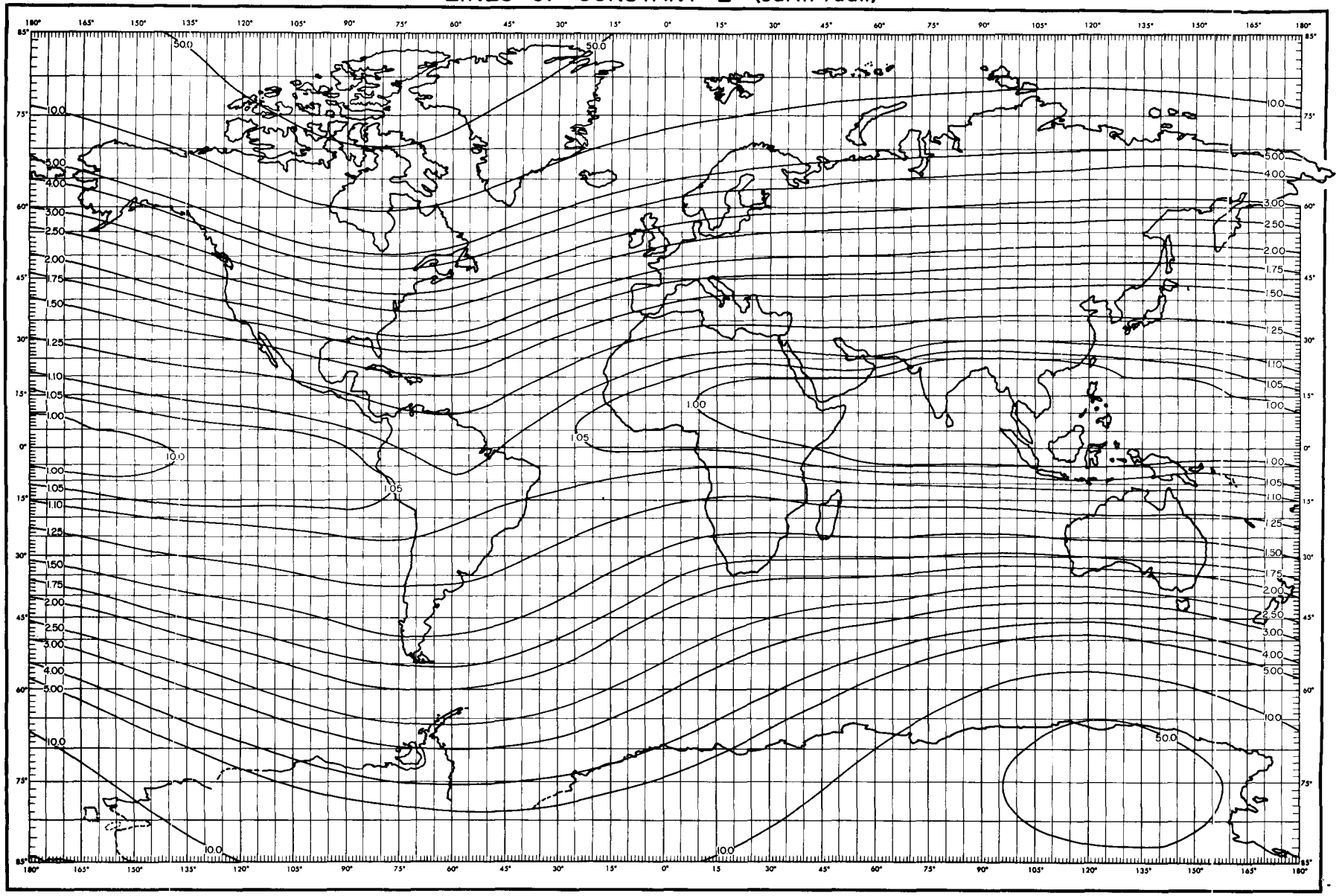
Table 7 (Continued)

| Station | L | Conjugate Area | Country |
|---|---|---|---|
| Pearce | 1.86 | Ust Llya (Near Olovyannaya) | USSR |
| Pilar | 1.15 | Manarunga (Bolivar) | Venezuela |
| Ponza | 1.51 | Kukong | Bechuanaland |
| Port aux Francais | 3.68 | Vasilevo (Near Kotlas) | USSR |
| Posadas | 1.13 | Near Boa Vista (Rio Branco) | Brazil |
| Pretoria | 1.59 | Dubrovnik | Yugoslavia |
| Punta Arenas | 1.62 | Caicos Island (Bahamas) | UK |
| Pyongyang | 1.33 | Great Sandy Desert (Western Australia) | Australia |
| Roma | 1.56 | Near Vryburg | RSA |
| San Juan | 1.43 | Near Puerto Deseado | Argentina |
| Santiago | 1.17 | Nueva Antioquia (Arauco) | Colombia |
| Sao Jose dos Campos Sao Paulo | 1.12 | Near Oscar | French Guayana |
| Sapporo | 1.47 | Eara Heedy (Western Australia) | Australia |
| Seoul | 1.28 | Great Sandy Desert (Western Australia) | Australia |
| Simosato | 1.18 | Tanumbirini (Northern Territory) | Australia |
| Shackleton | 4.61 | St. Augustine River (Prov. of Quebec) | Canada |
| Stellenbosch | 1.82 | Saint Martial (Near Bordeaux) | France |

Table 7 (Continued)

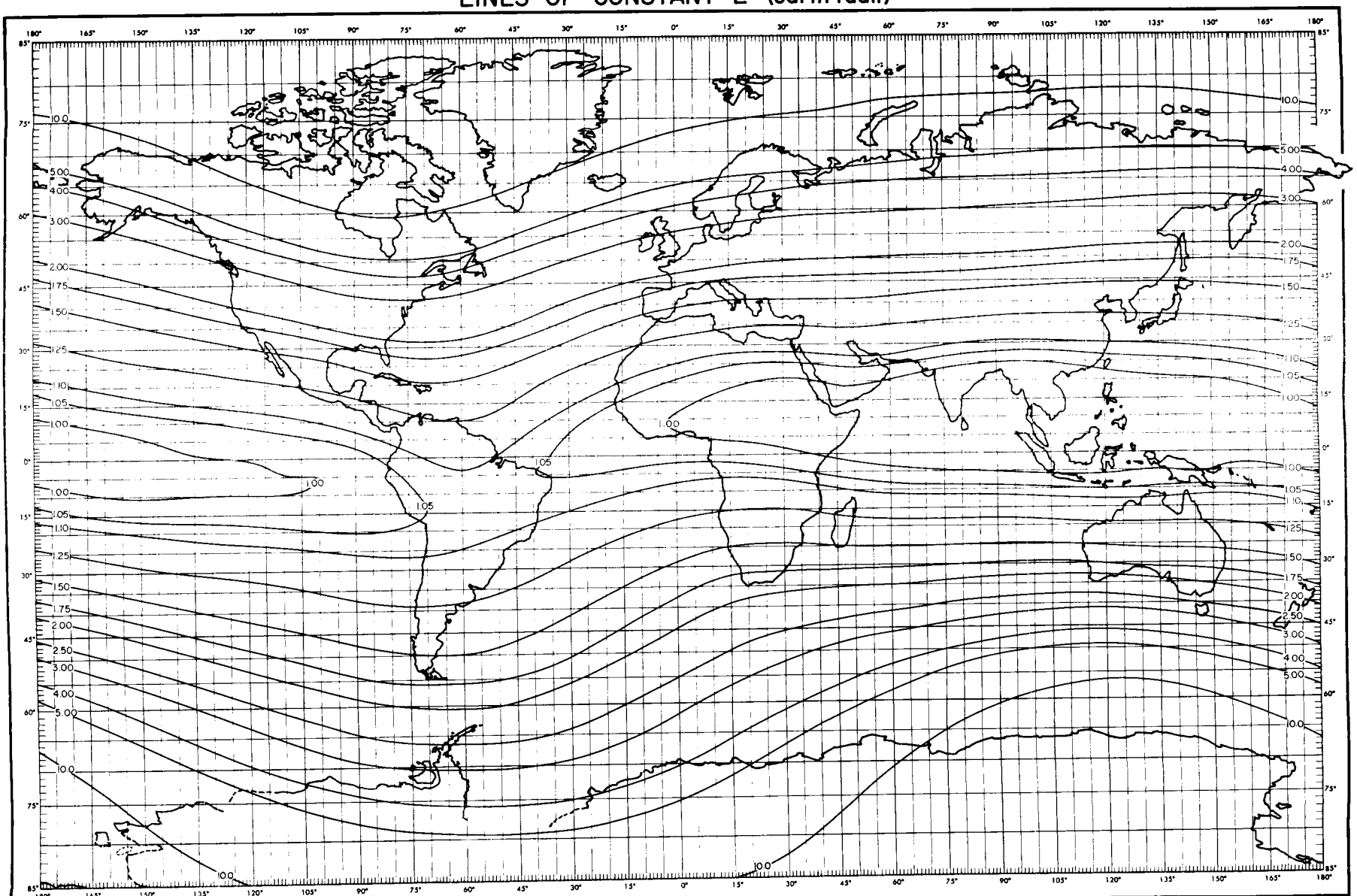
| Station | L | Conjugate Area | Country |
|---|---|---|---|
| Torino | 1.78 | Nelspoort (Near Beaufort West) | RSA |
| Tortosa | 1.57 | Bogenfels (Near Luderitz) | South West Africa |
| Torre Chiaruccia | 1.57 | Near Vryburg | RSA |
| Tottori | 1.23 | Tennant Creek (Northern Territory) | Australia |
| Toyokawa | 1.24 | Alexandria (Northern Territory) | Australia |
| Trinidad | 1.26 | Near Mar del Plata | Argentina |
| Tsumeb | 1.34 | Tabarka (Near Tunis) | Tunisia |
| Tucuman | 1.11 | Uaruti (Amazonas) | Brazil |
| Uji | 1.21 | Tennant Creek (Northern Territory) | Australia |
| Vladivostok | 1.50 | Great Victoria Deserts (South Australia) | Australia |
| Wakkanai | 1.56 | Eta Dunna (South Australia) | Australia |
| Yamagawa | 1.13 | Near Port Keats (Northern Territory) | Australia |
| Yuzhno-Sakhalinsk | 1.64 | Blanchewater (South Australia) | Australia |

# LINES OF CONSTANT L (earth radii)



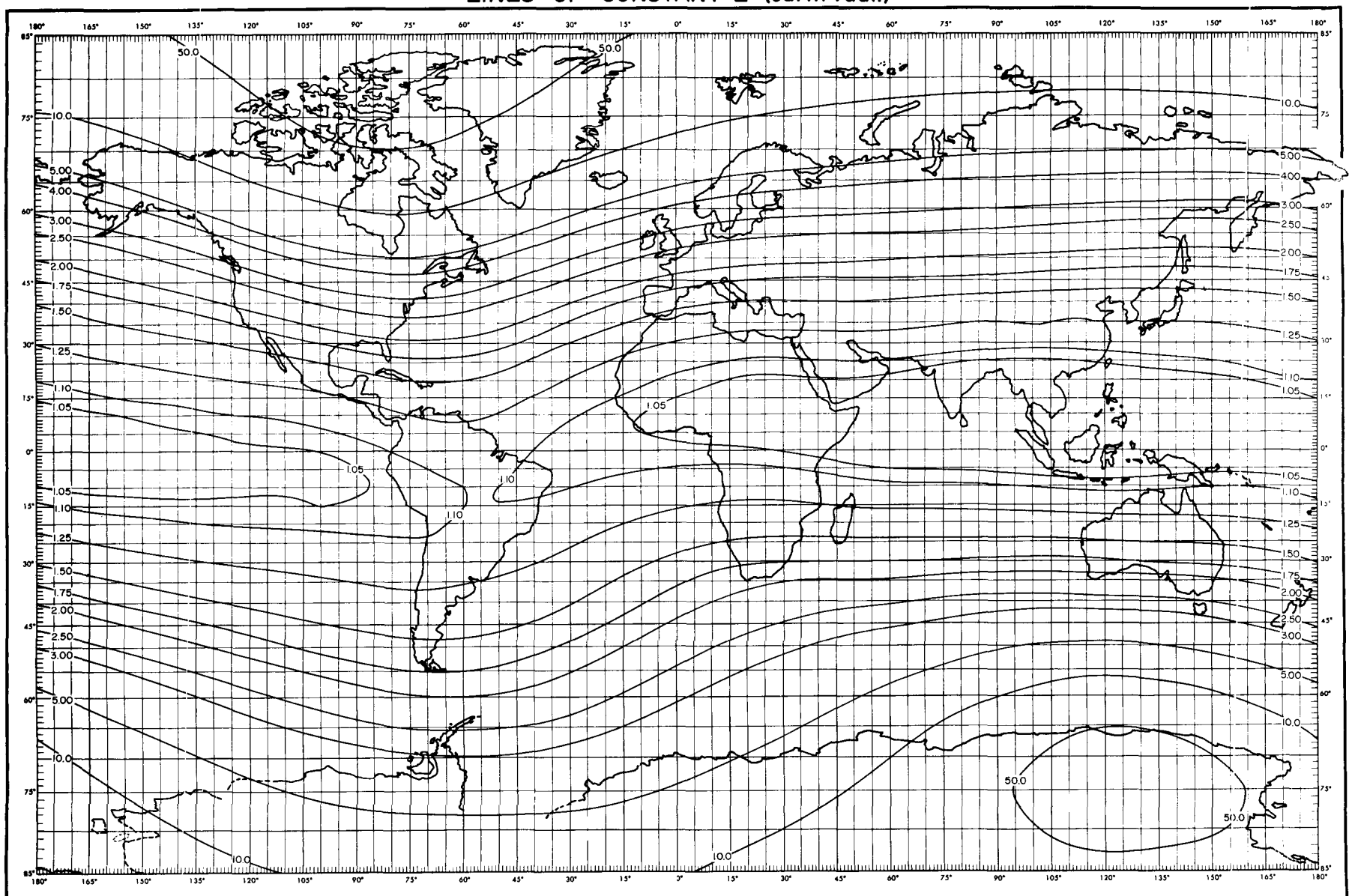

ALTITUDE 100 KM

# LINES OF CONSTANT L (earth radii)



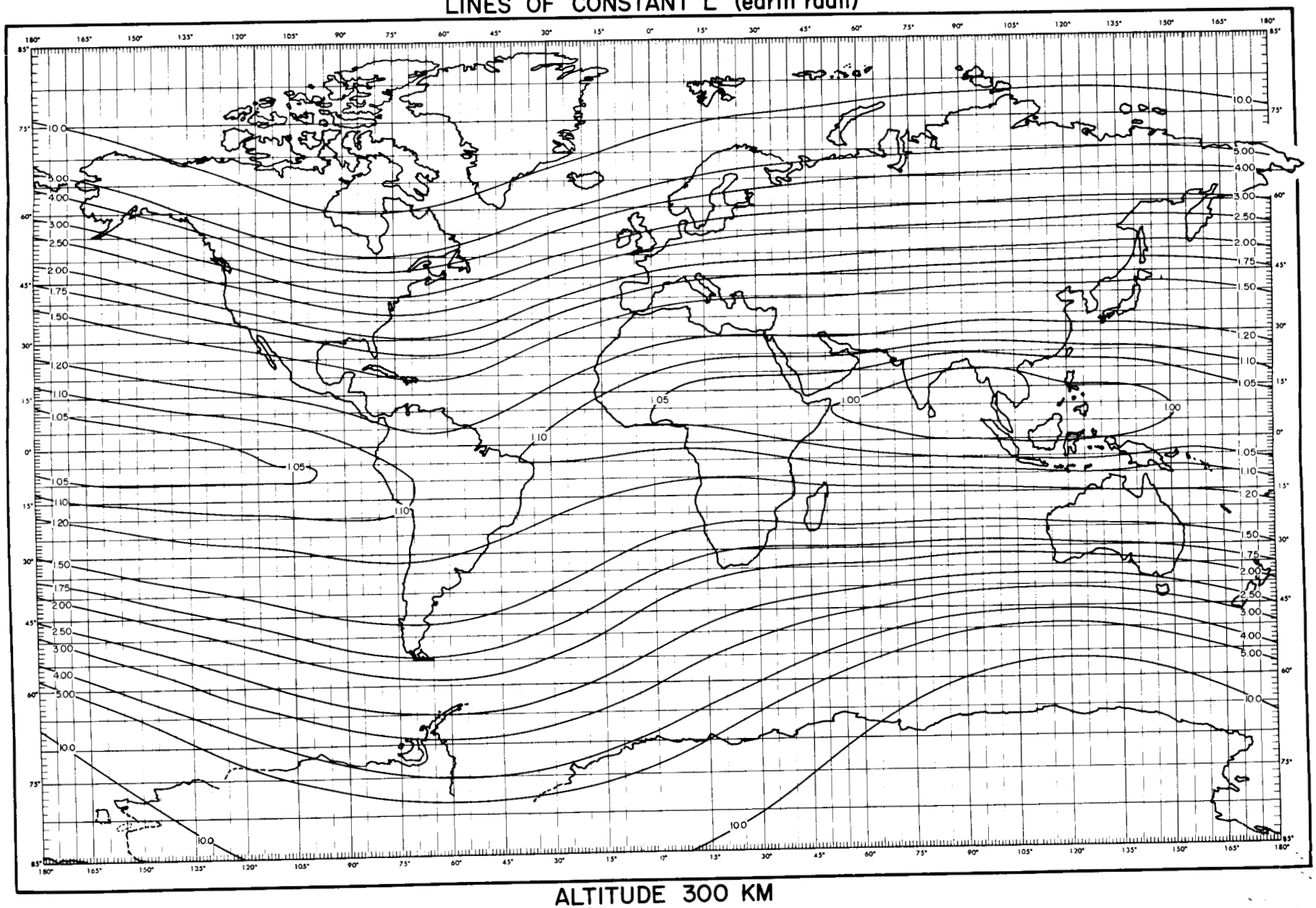

ALTITUDE 0 KM

LINES OF CONSTANT L (earth radii)



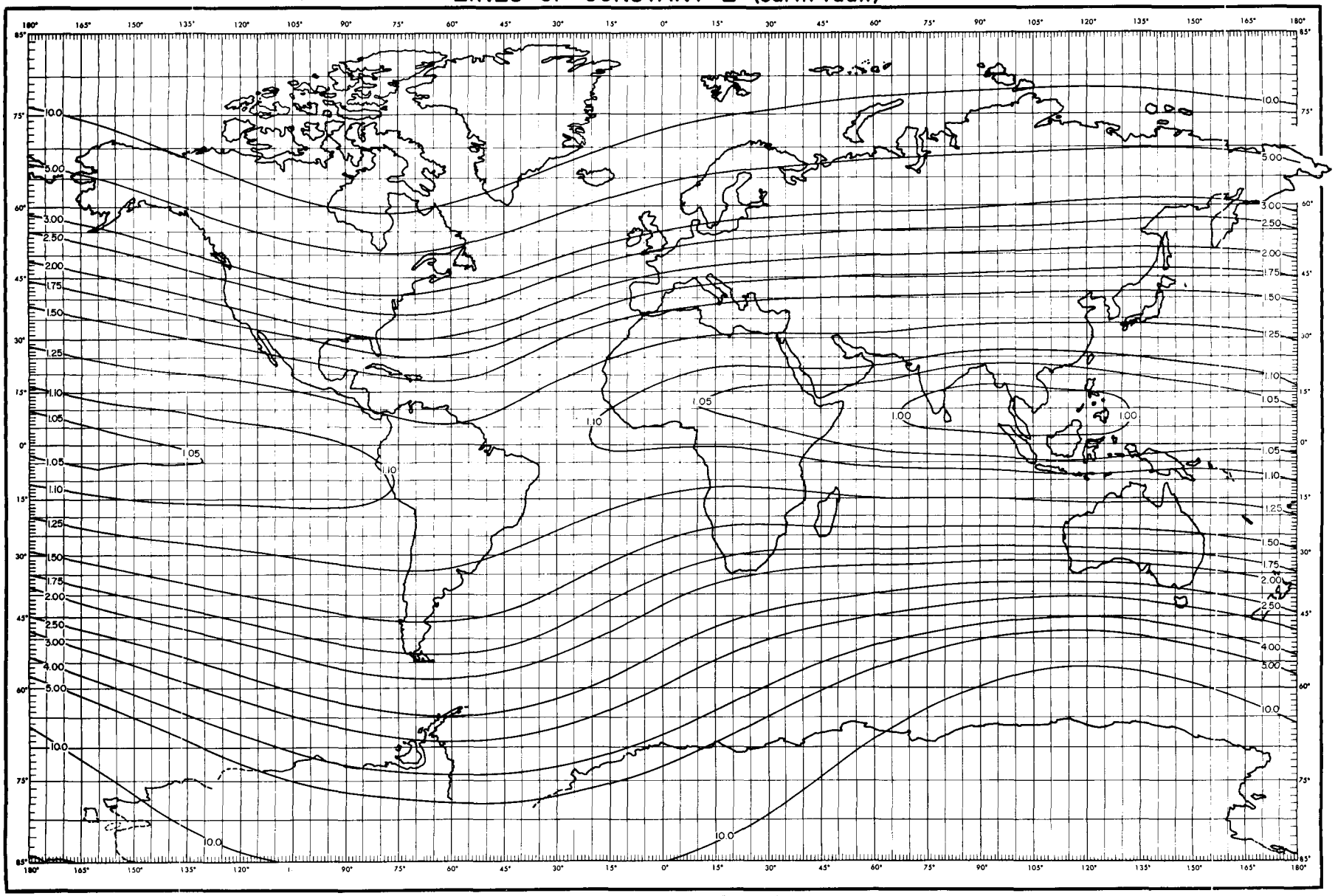

ALTITUDE 200 KM

# LINES OF CONSTANT L (earth radii)



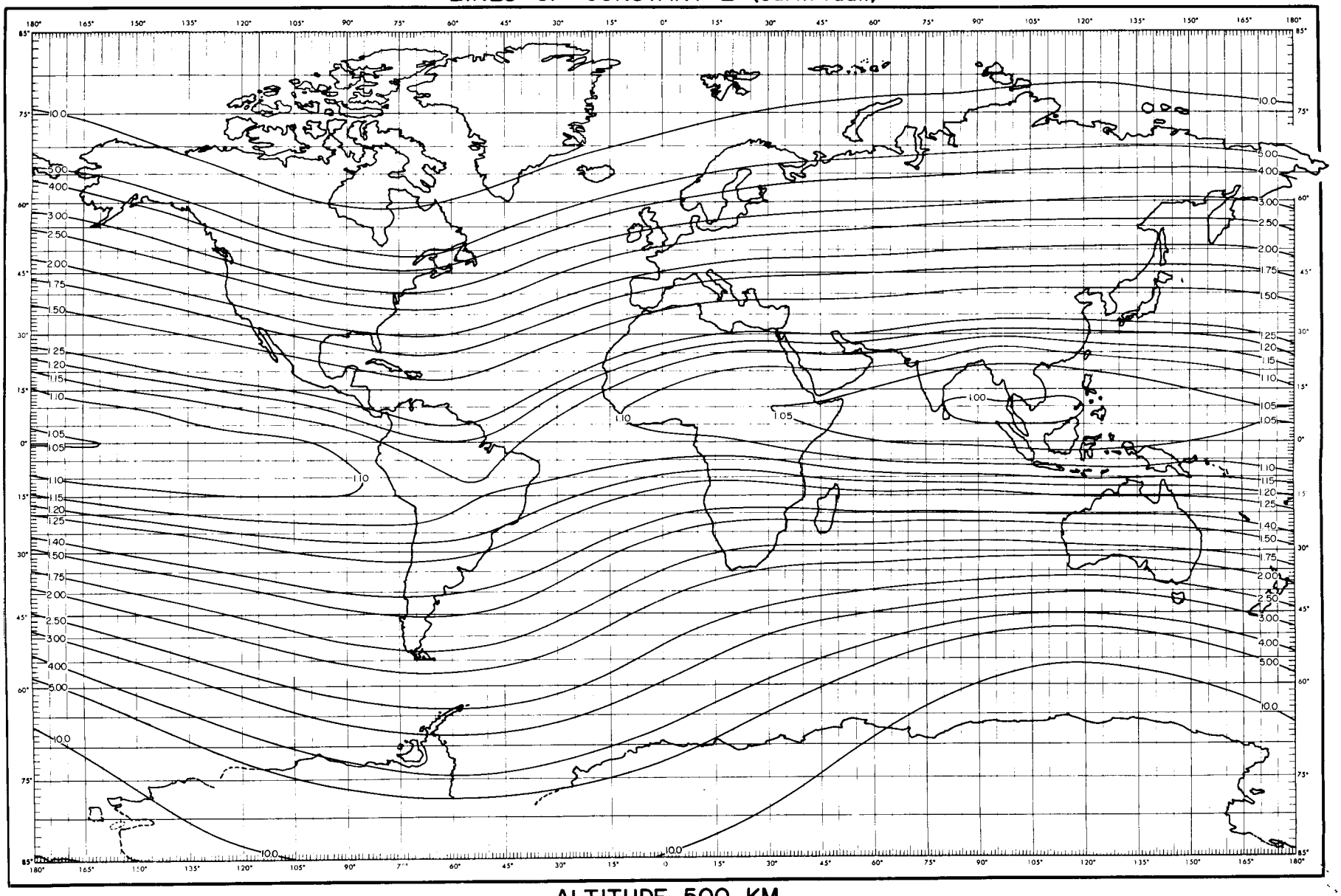

ALTITUDE 300 KM

# LINES OF CONSTANT L (earth radii)



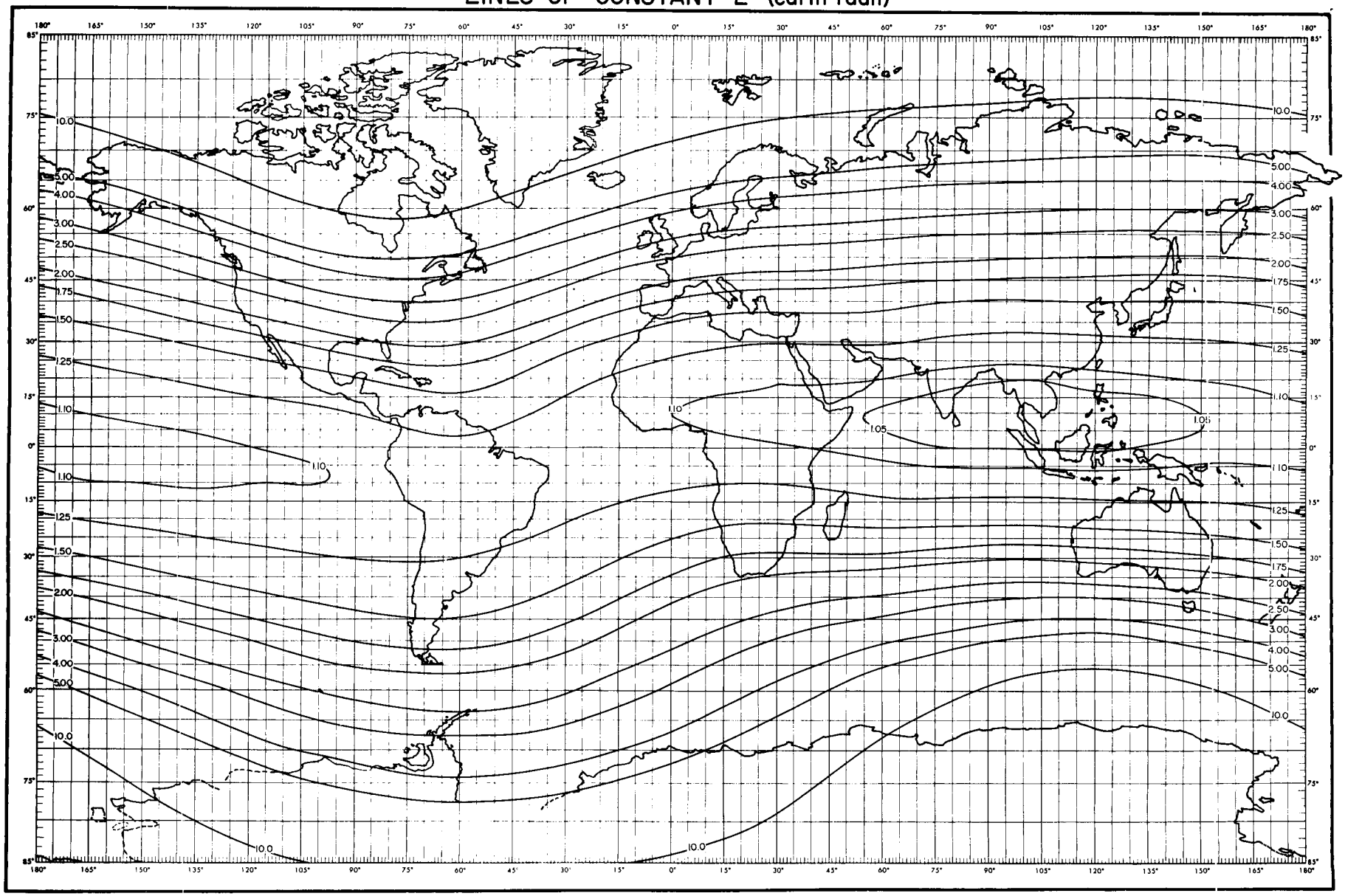

ALTITUDE 400 KM

# LINES OF CONSTANT L (earth radii)



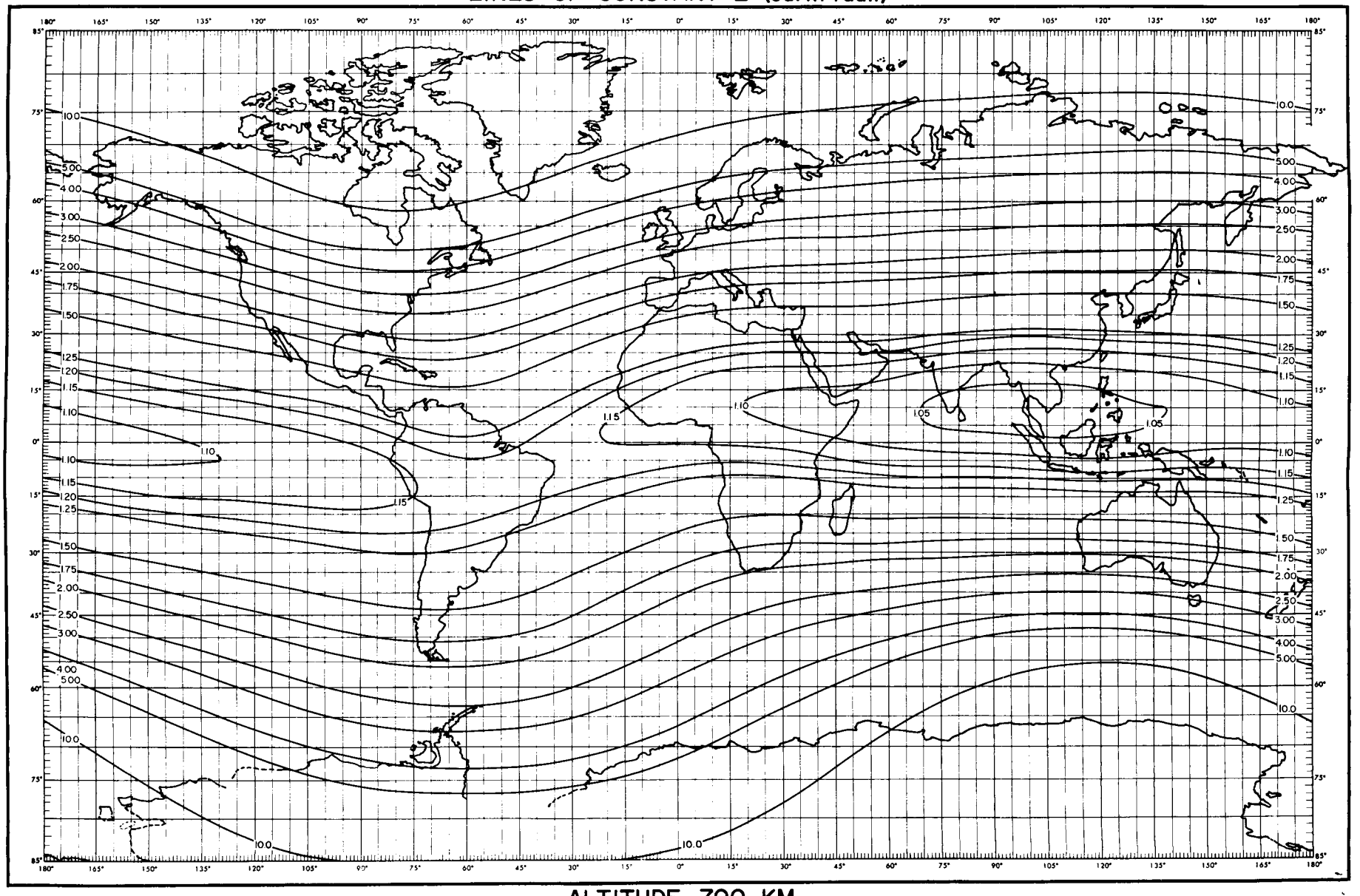

ALTITUDE 500 KM

# LINES OF CONSTANT L (earth radii)




ALTITUDE 600 KM

# LINES OF CONSTANT L (earth radii)




ALTITUDE 700 KM

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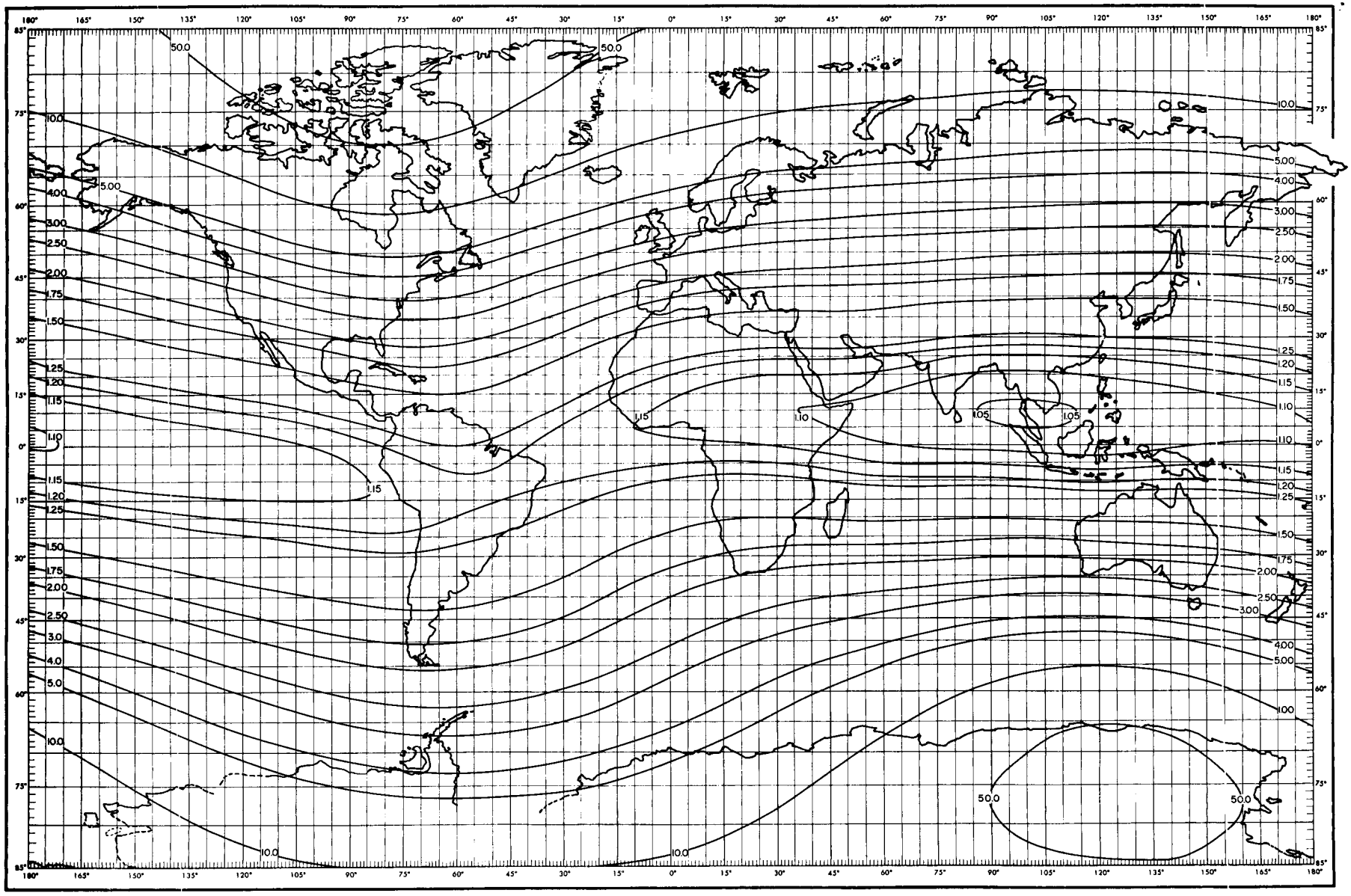
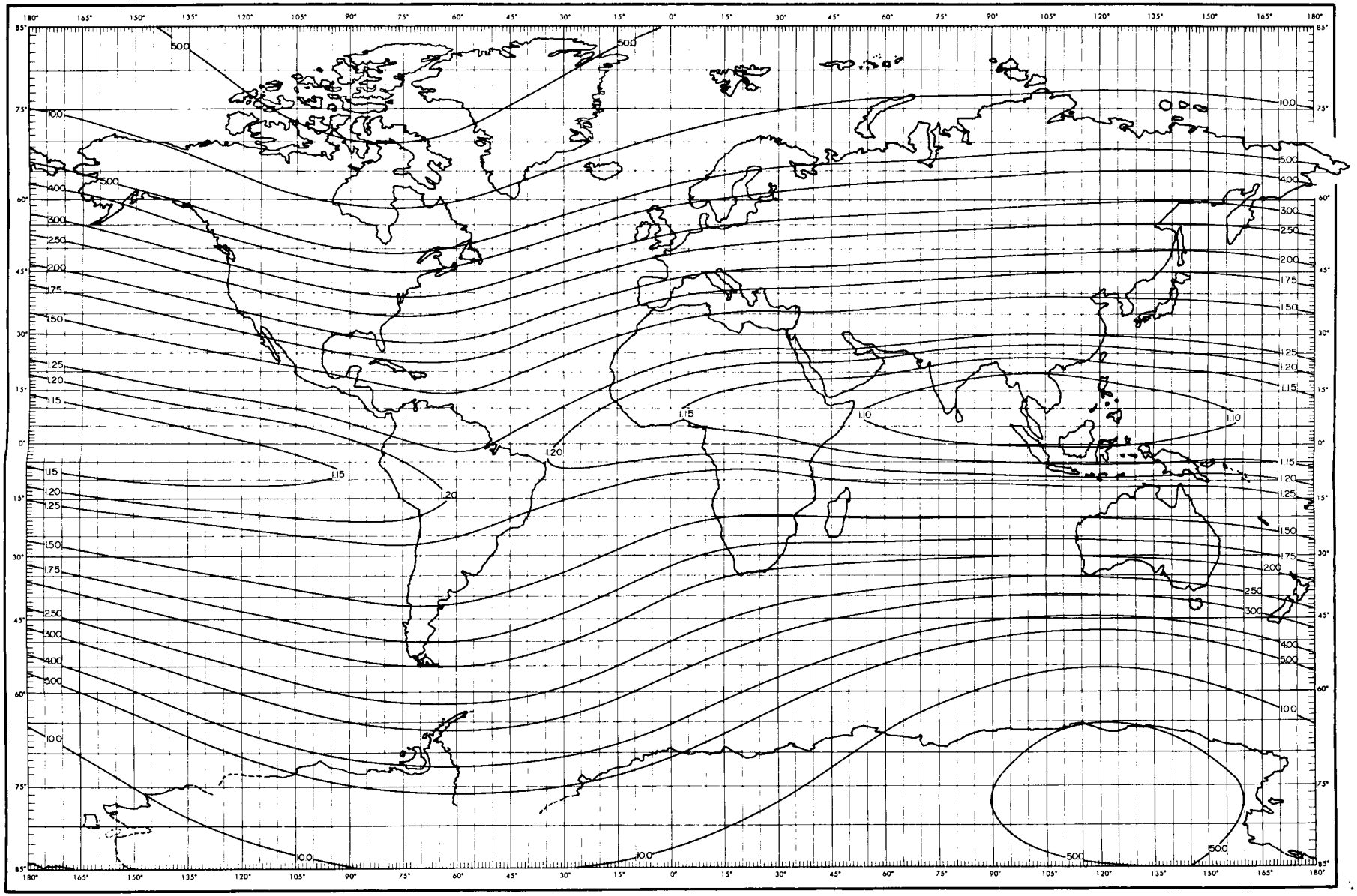


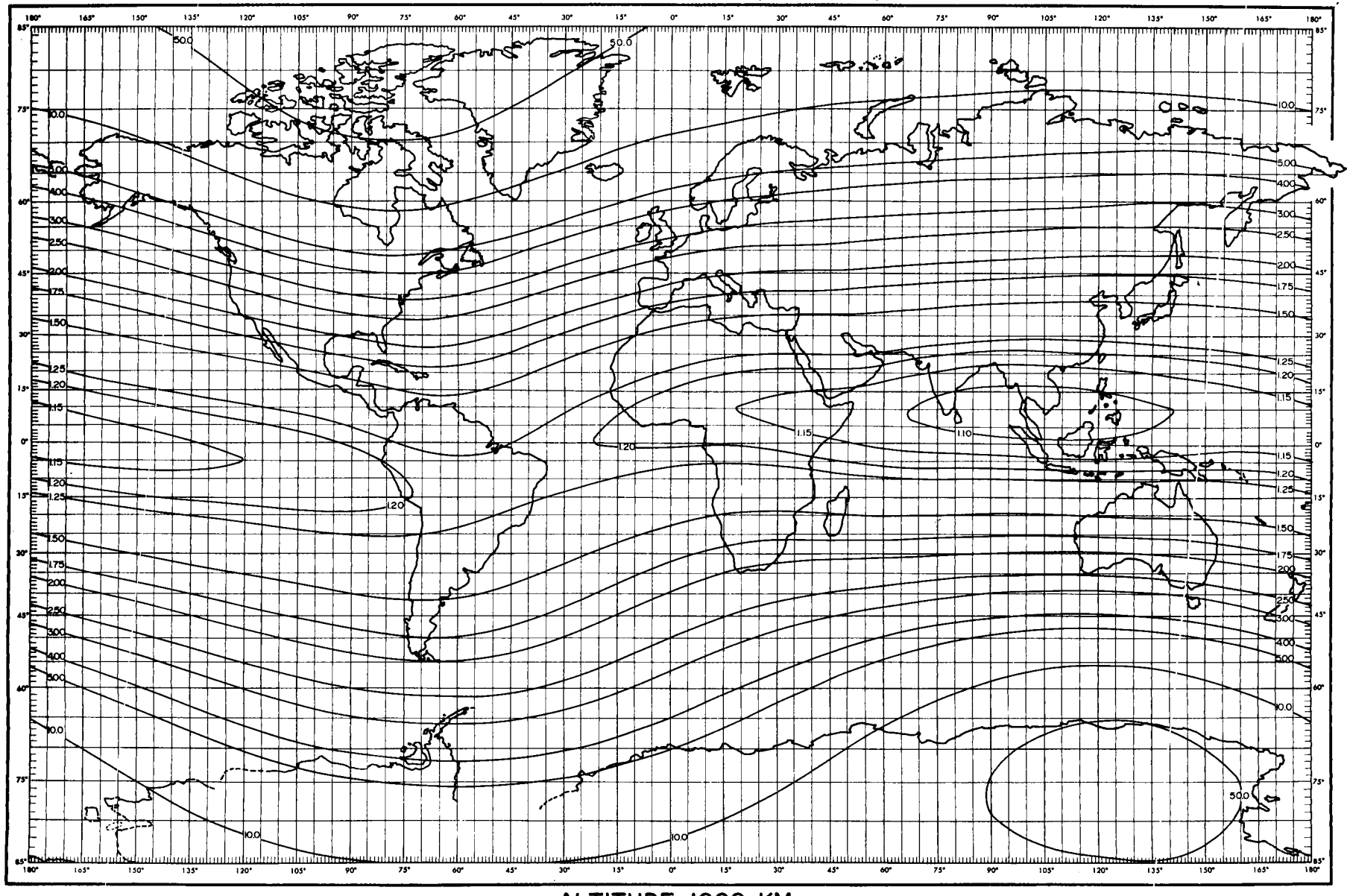

ALTITUDE 800 KM

# LINES OF CONSTANT L (earth radii)



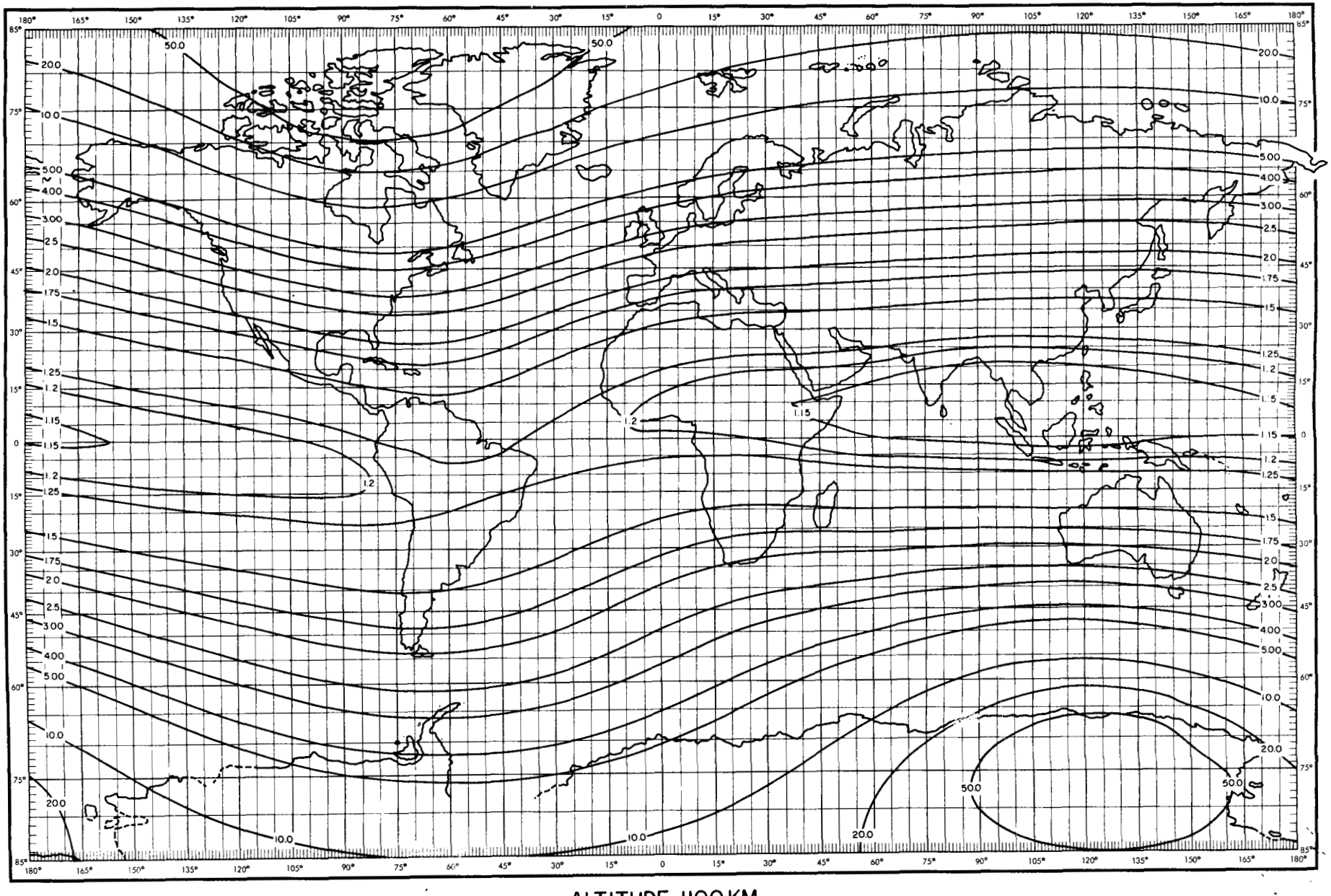

ALTITUDE 900 KM

# LINES OF CONSTANT L (earth radii)



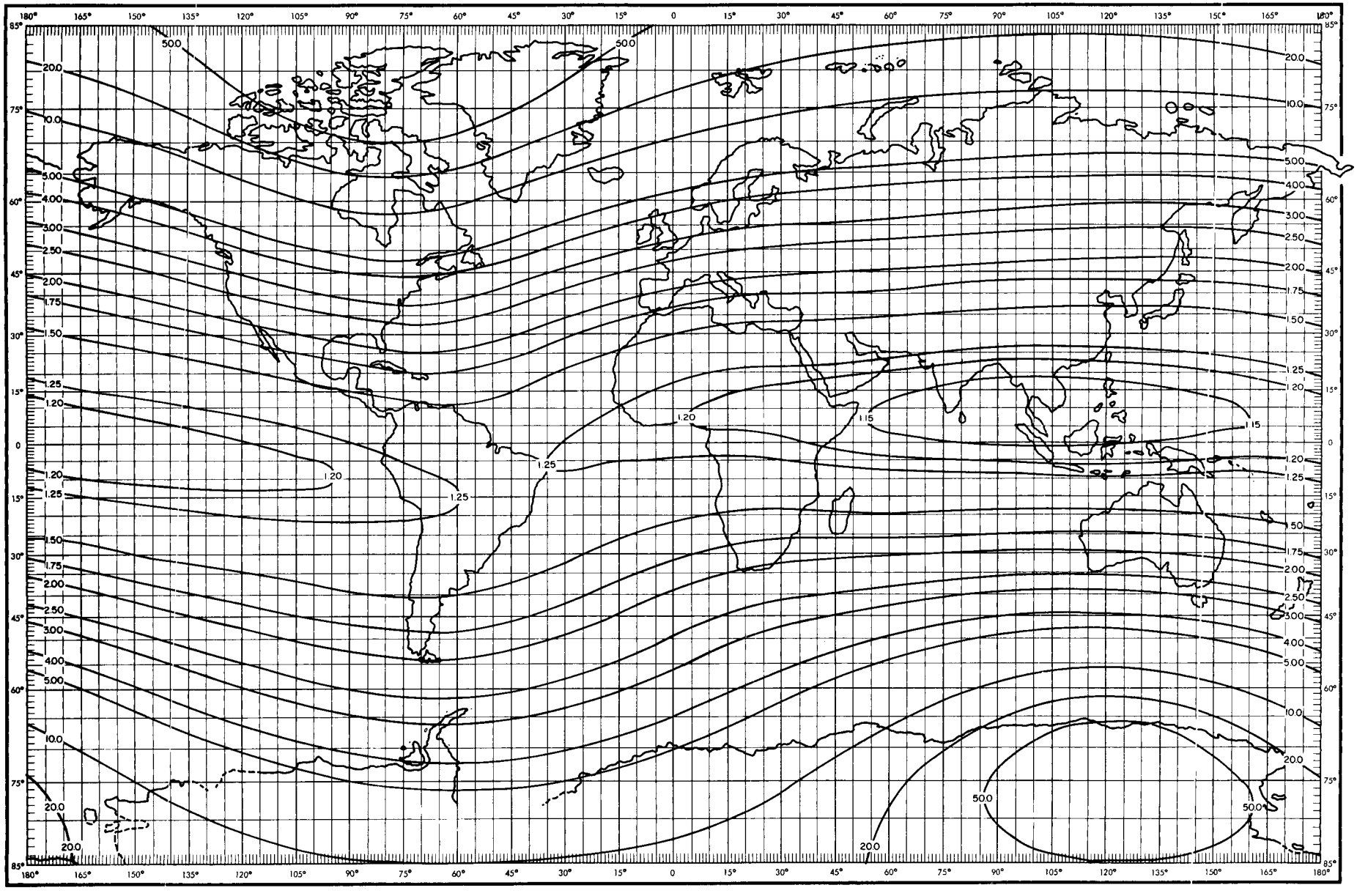

ALTITUDE 1000 KM

# LINES OF CONSTANT L (earth radii)



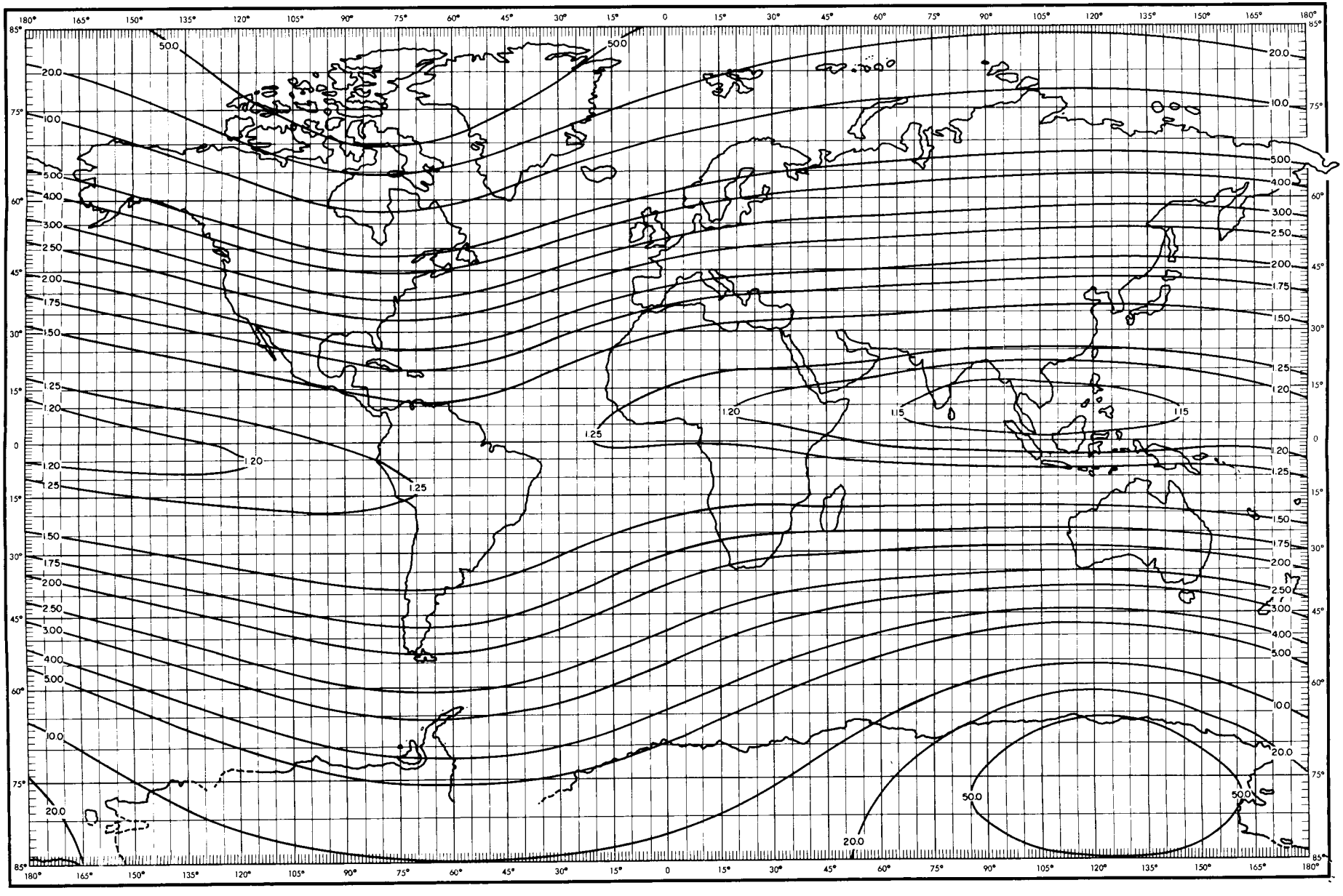

ALTITUDE 1100 KM

# LINES OF CONSTANT L (earth radii)




ALTITUDE 1200 KM

# LINES OF CONSTANT L (earth radii)

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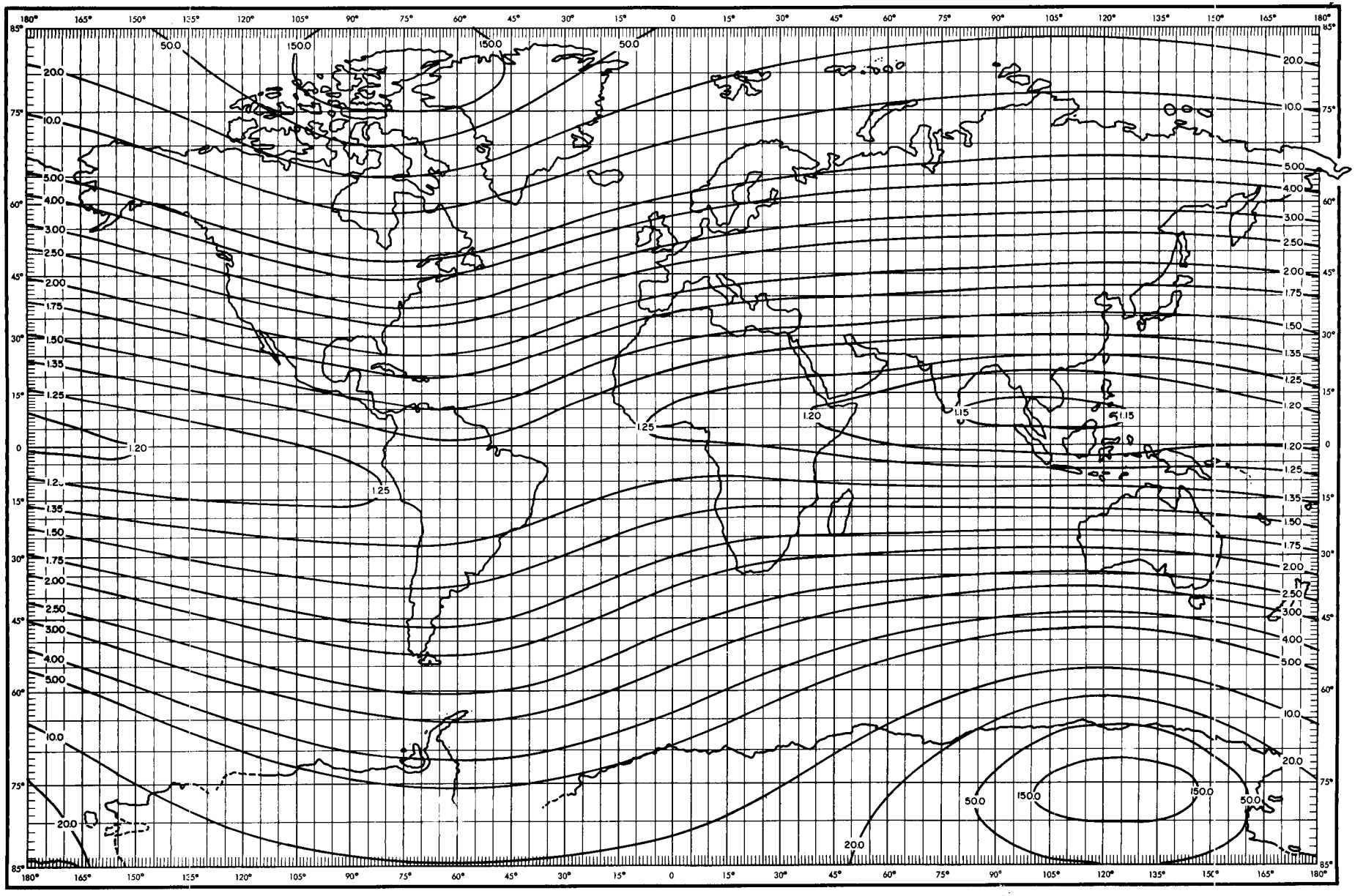
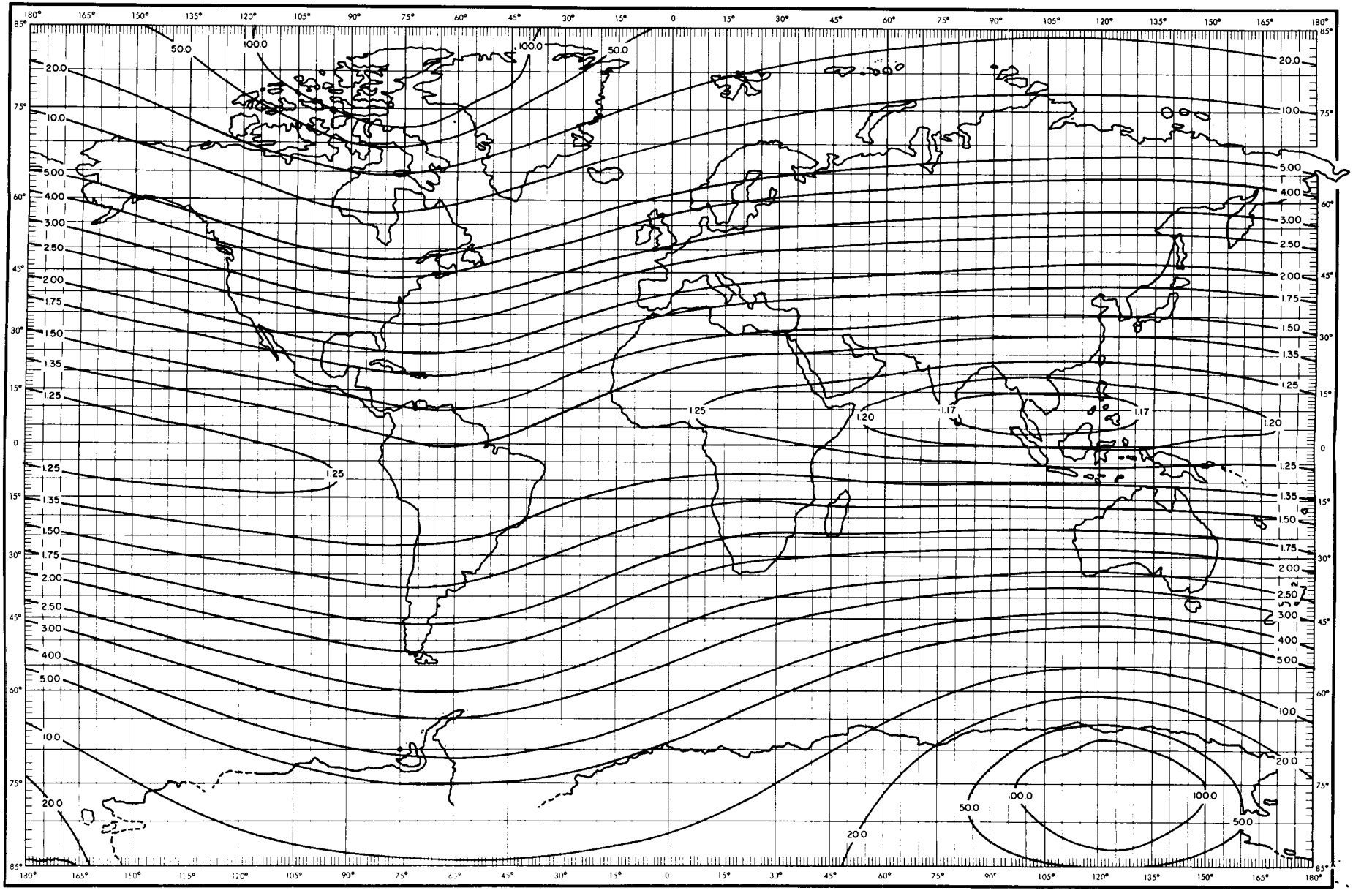
## LINES OF CONSTANT L (earth radii)



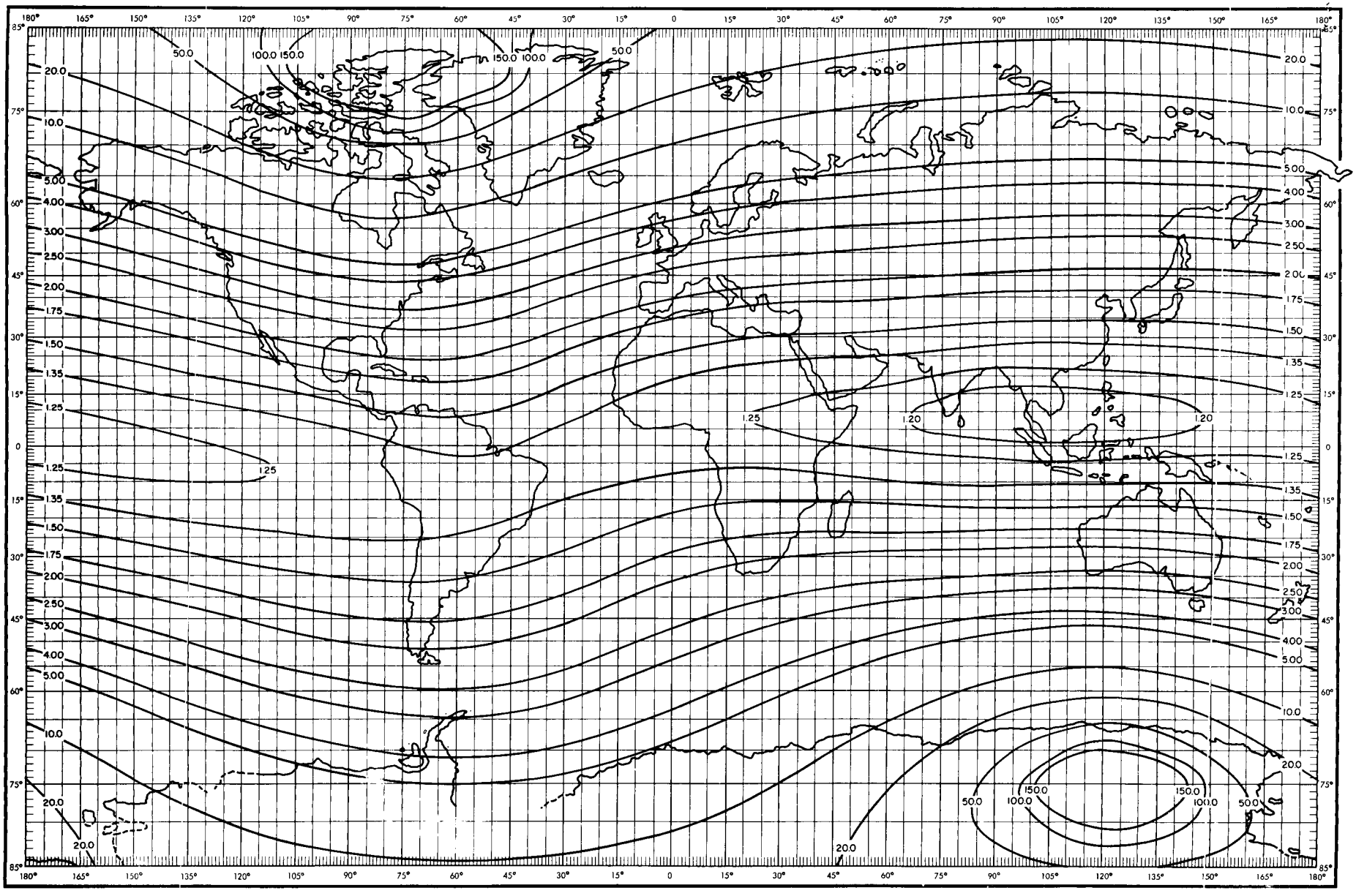

ALTITUDE 1400 KM

# LINES OF CONSTANT L (earth radii)



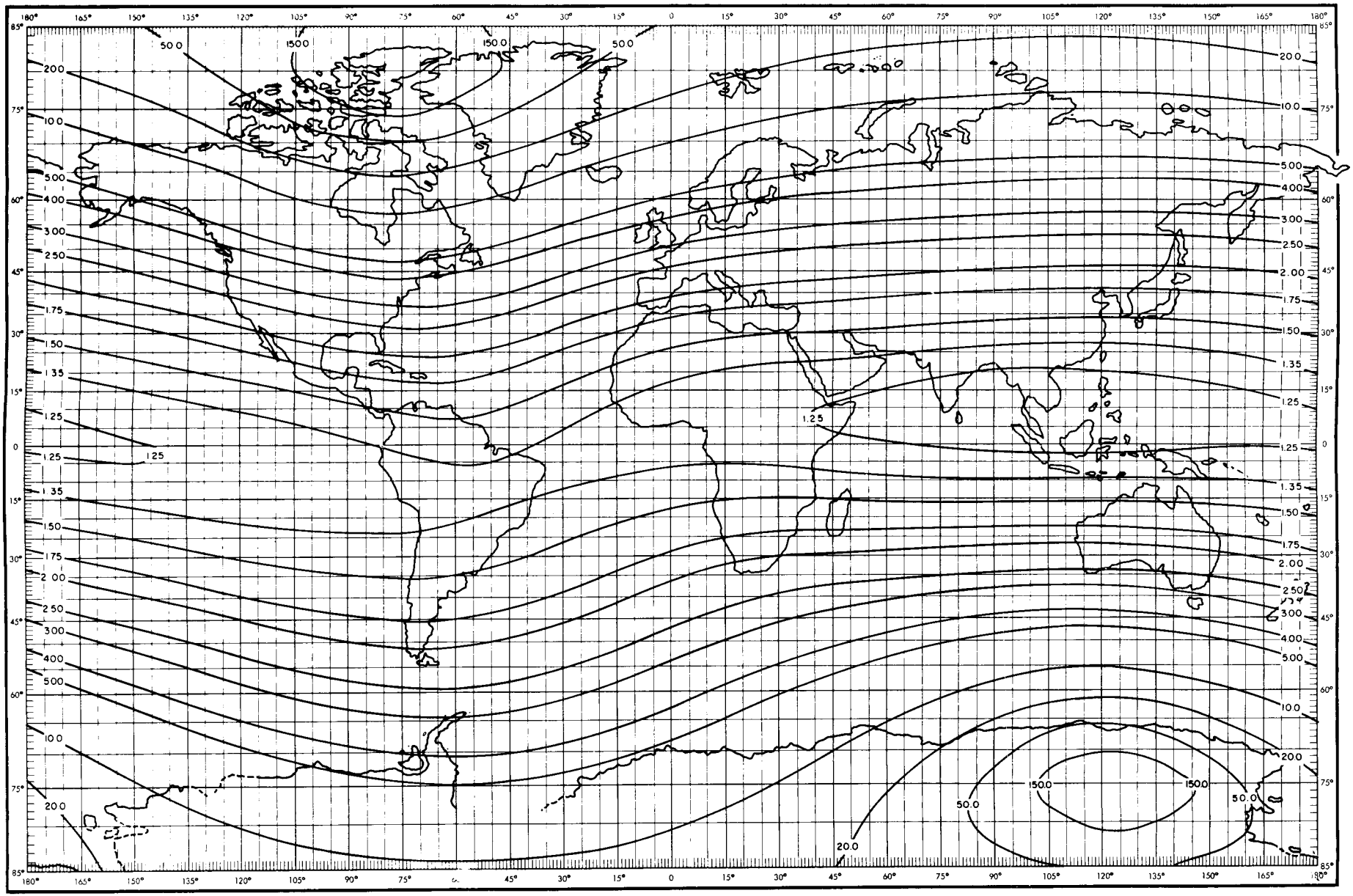

ALTITUDE 1500KM

# LINES OF CONSTANT L (earth radii)




ALTITUDE 1600 KM

# LINES OF CONSTANT L (earth radii)




ALTITUDE 1700 KM

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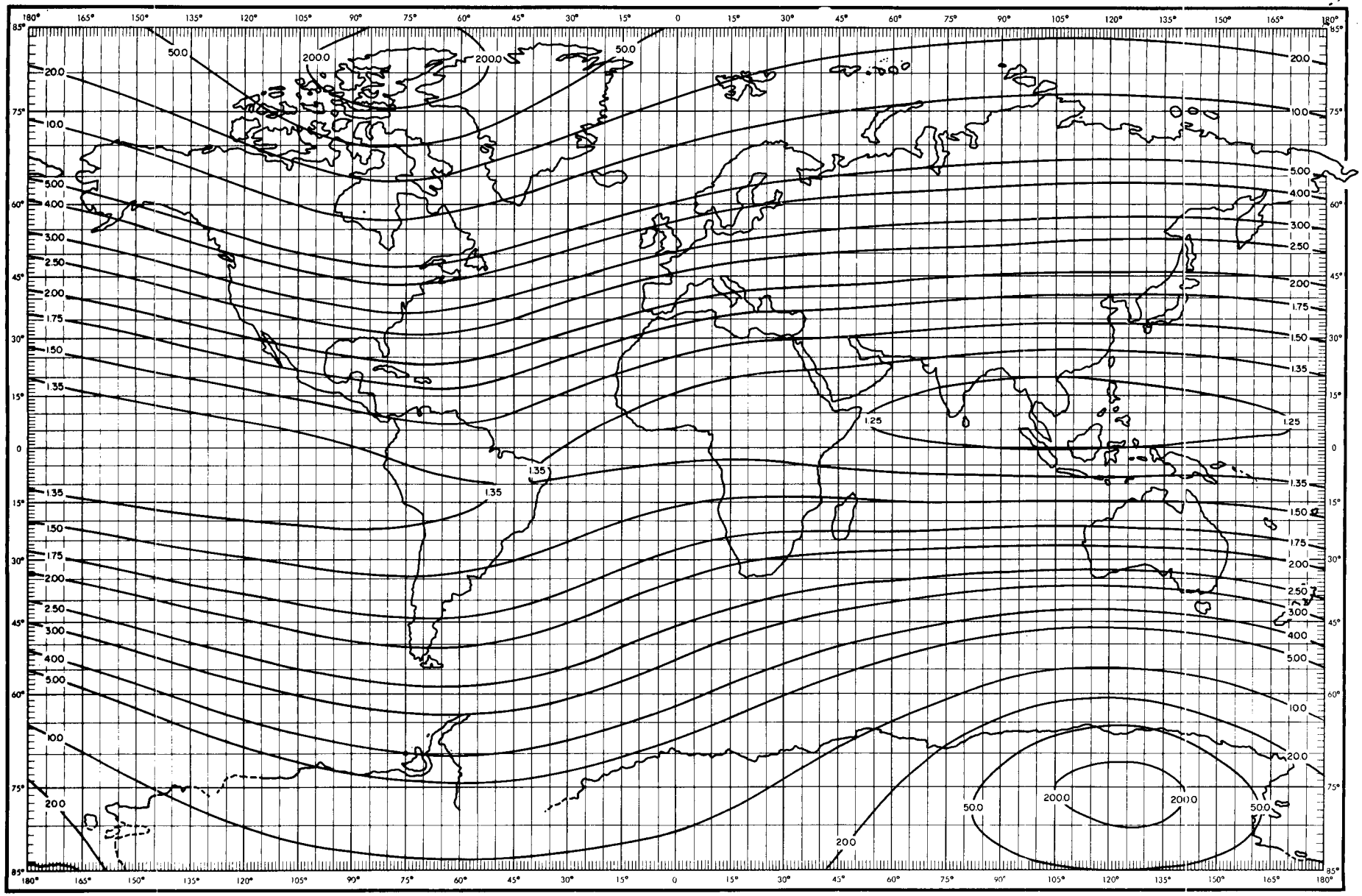
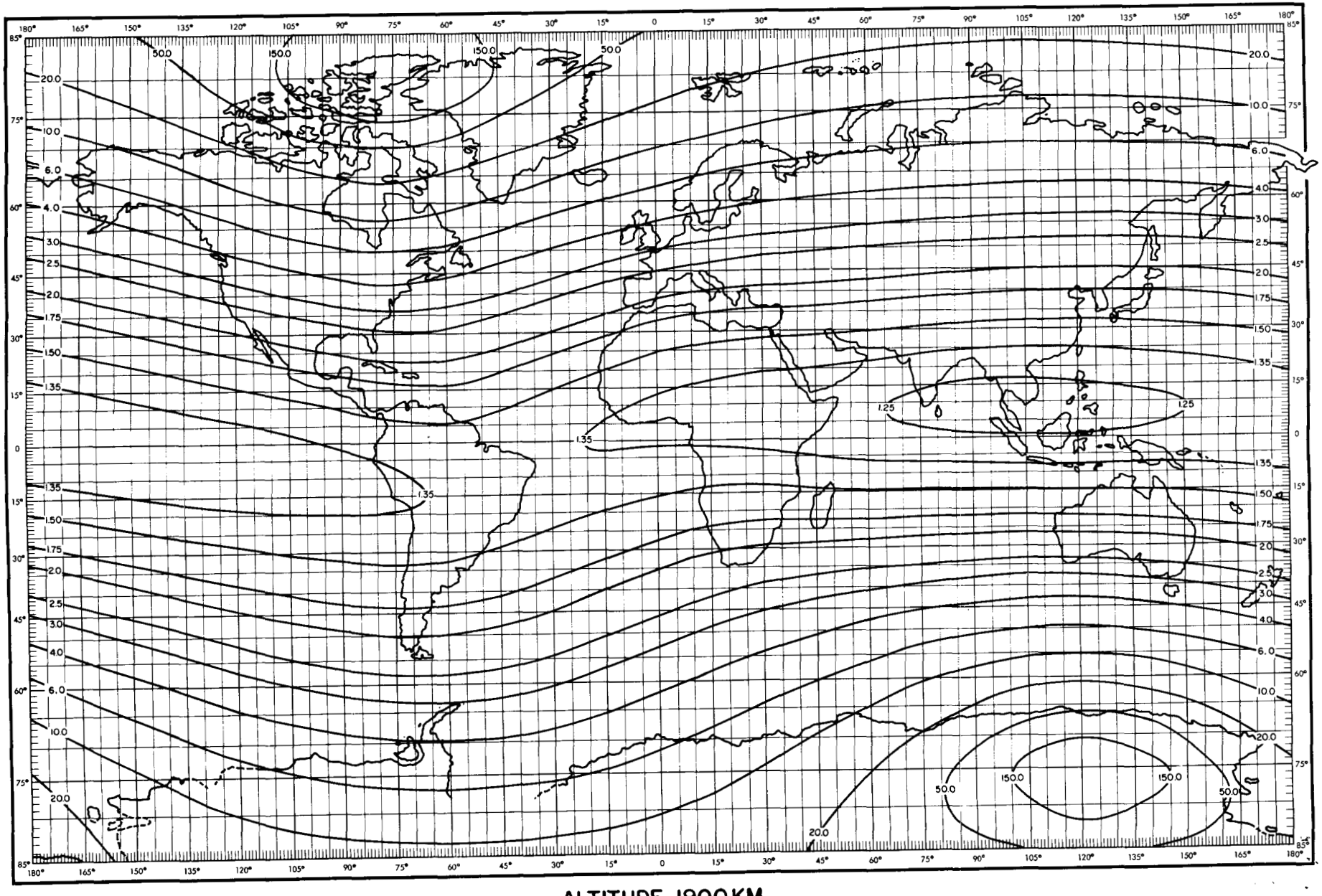


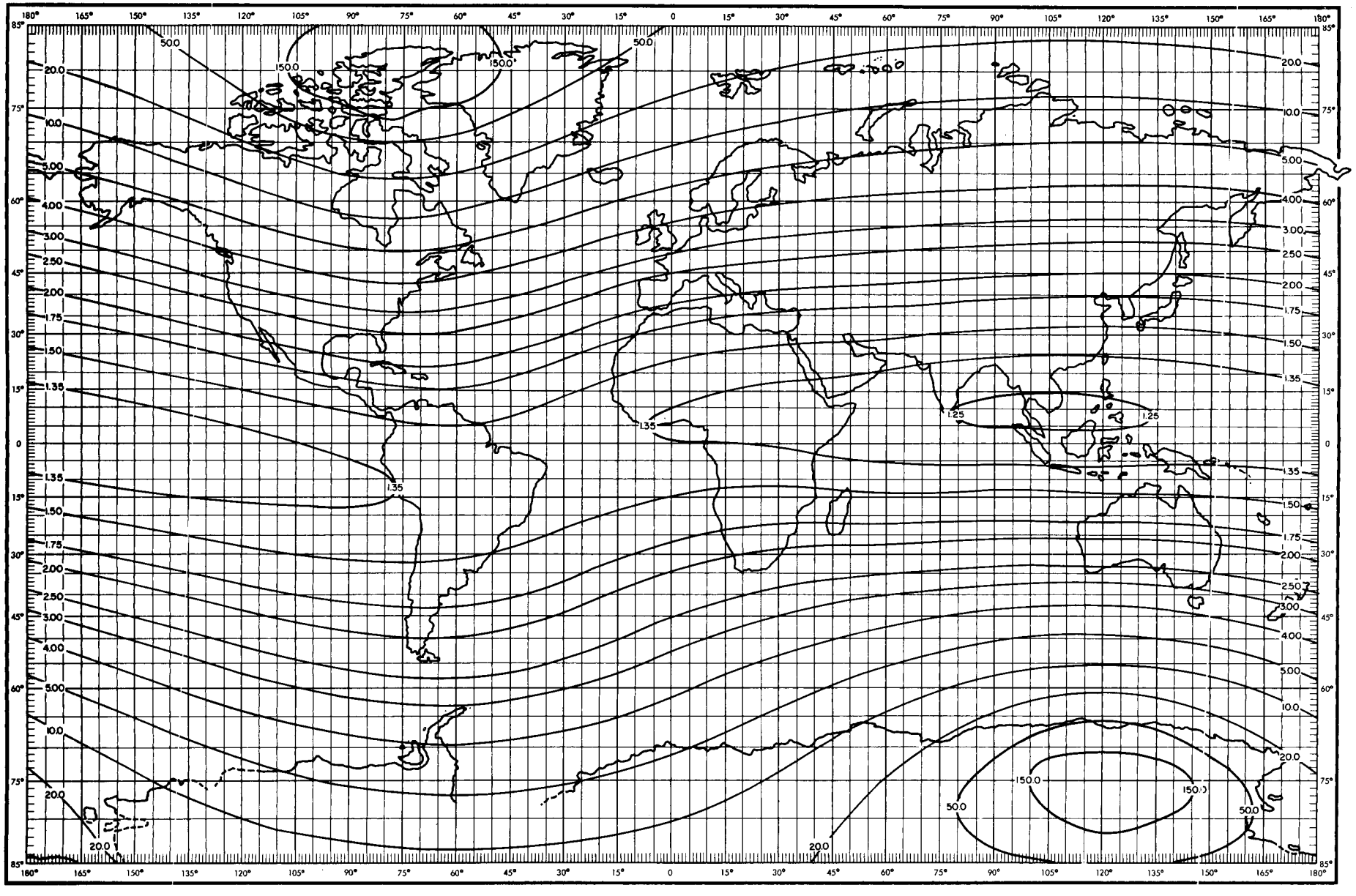

ALTITUDE 1800 KM

LINES OF CONSTANT L (earth radii)



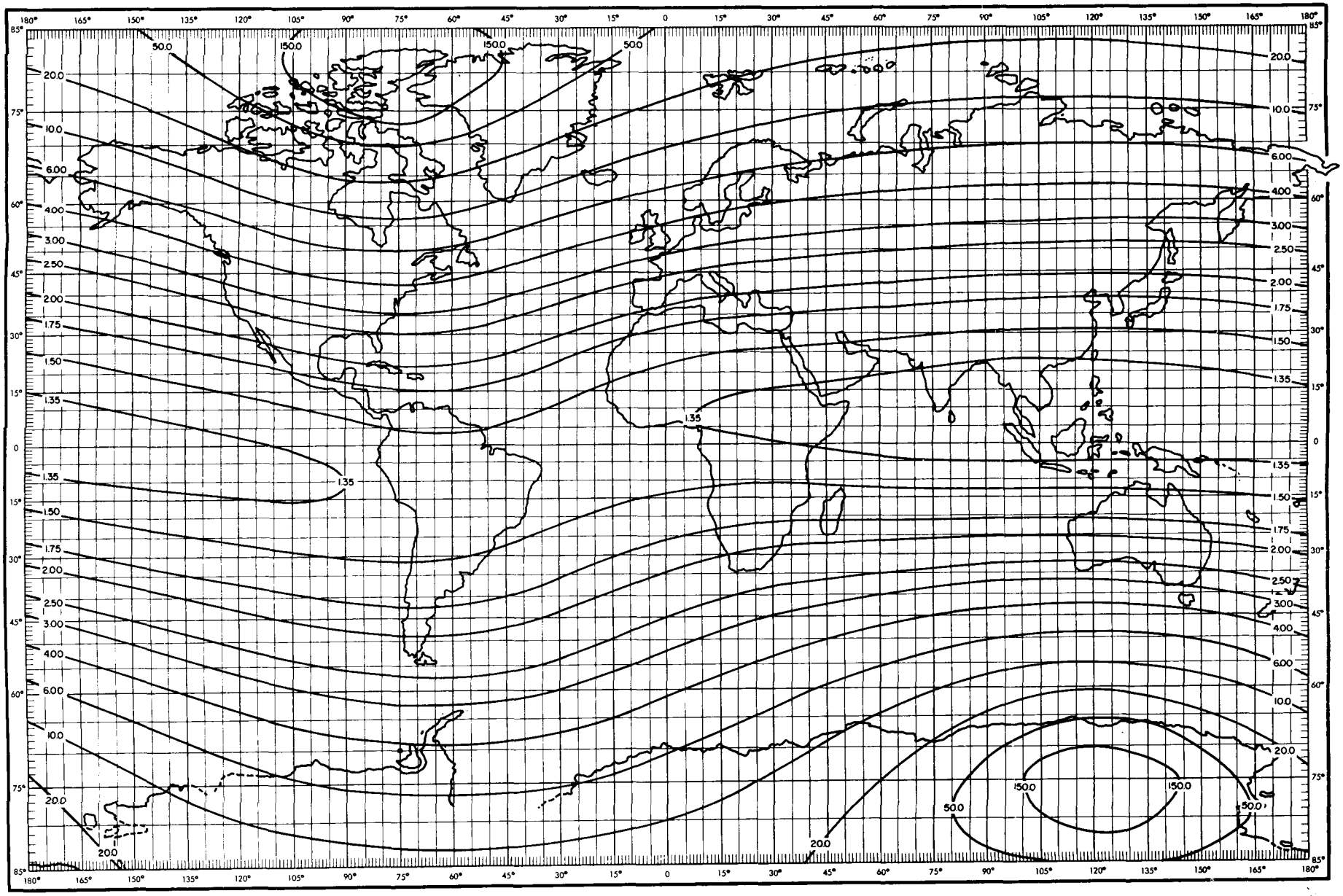

ALTITUDE 1900 KM

# LINES OF CONSTANT L (earth radii)



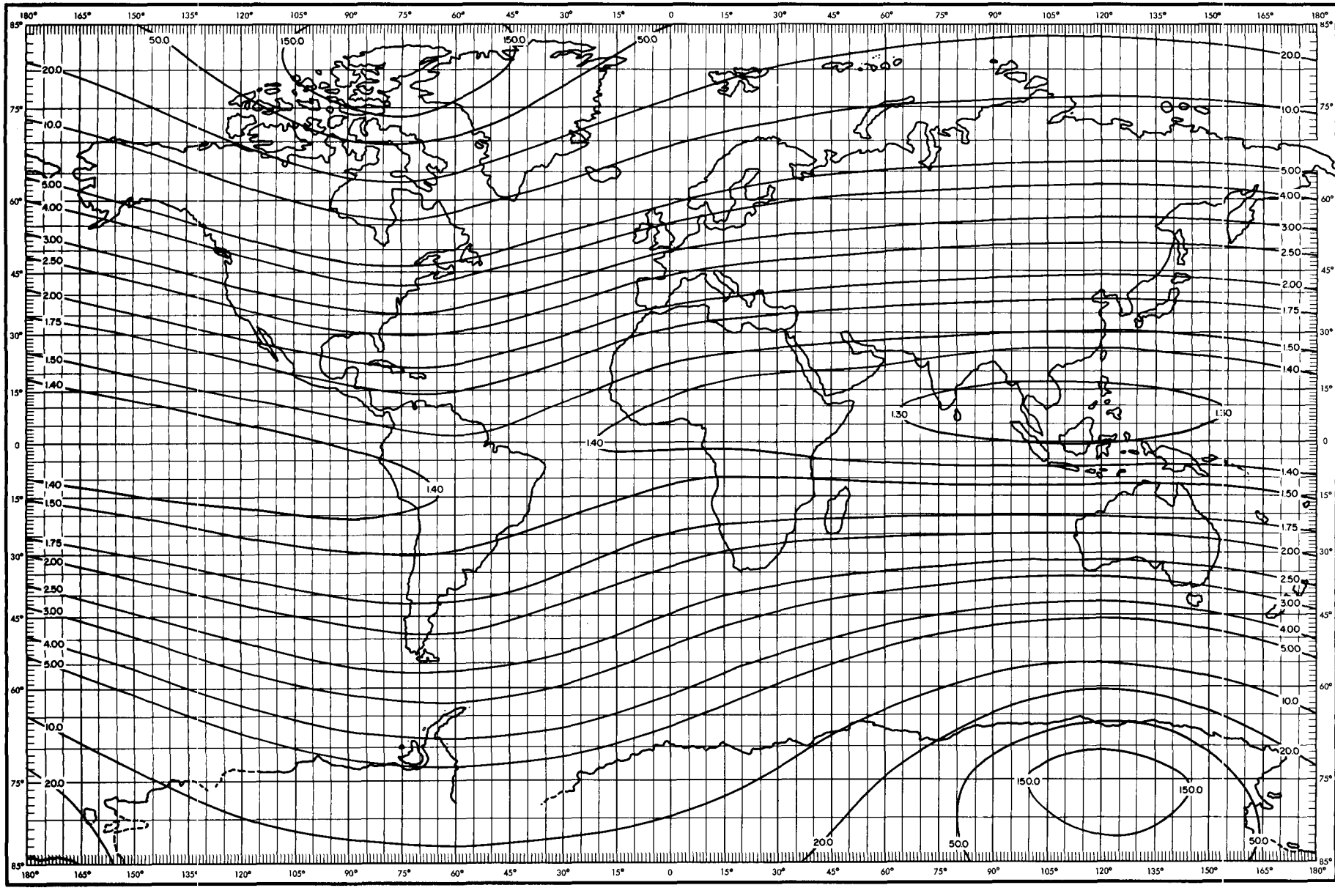

ALTITUDE 2000 KM

# LINES OF CONSTANT L (earth radii)




ALTITUDE 2100 KM

# LINES OF CONSTANT L (earth radii)




ALTITUDE 2200 KM

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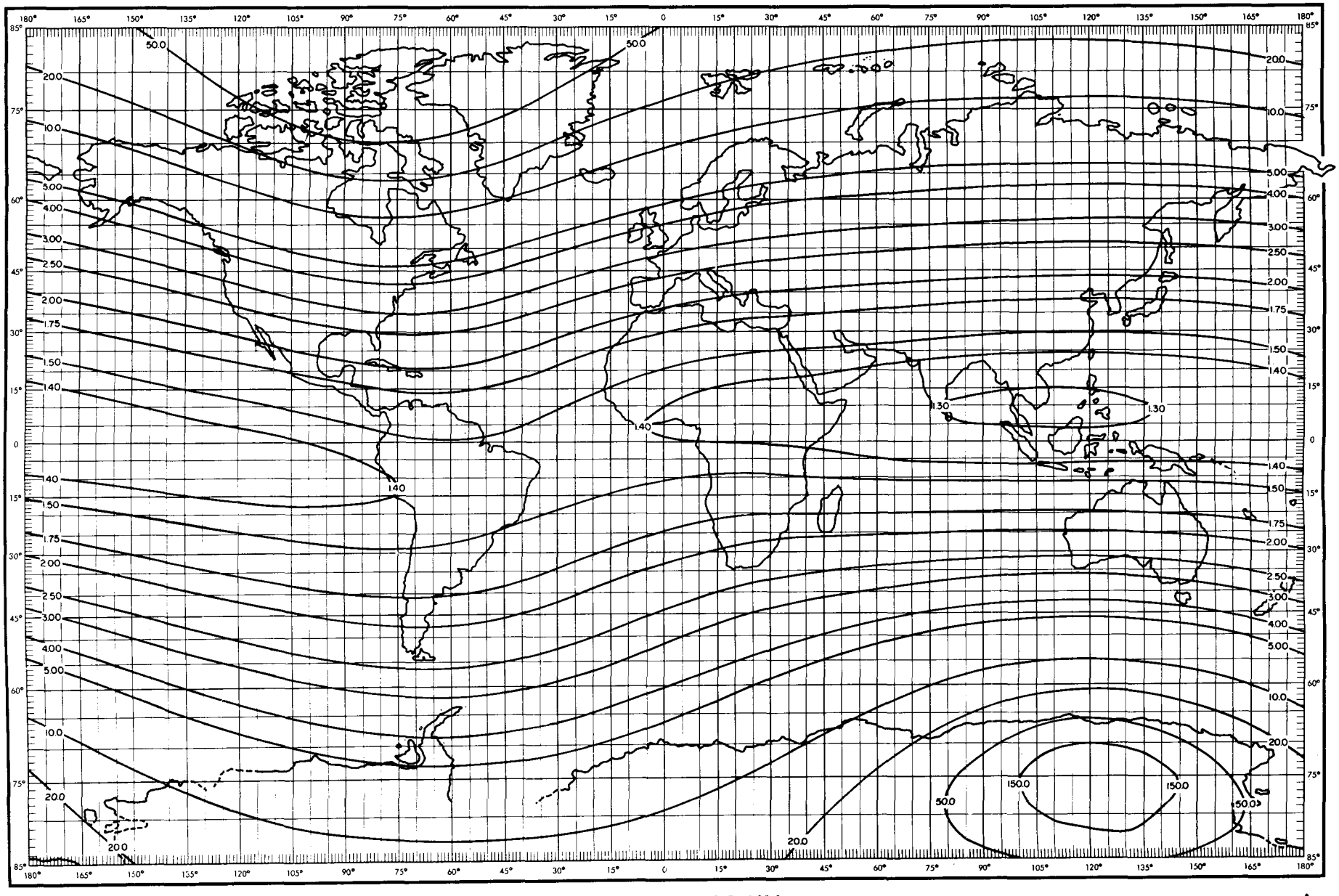
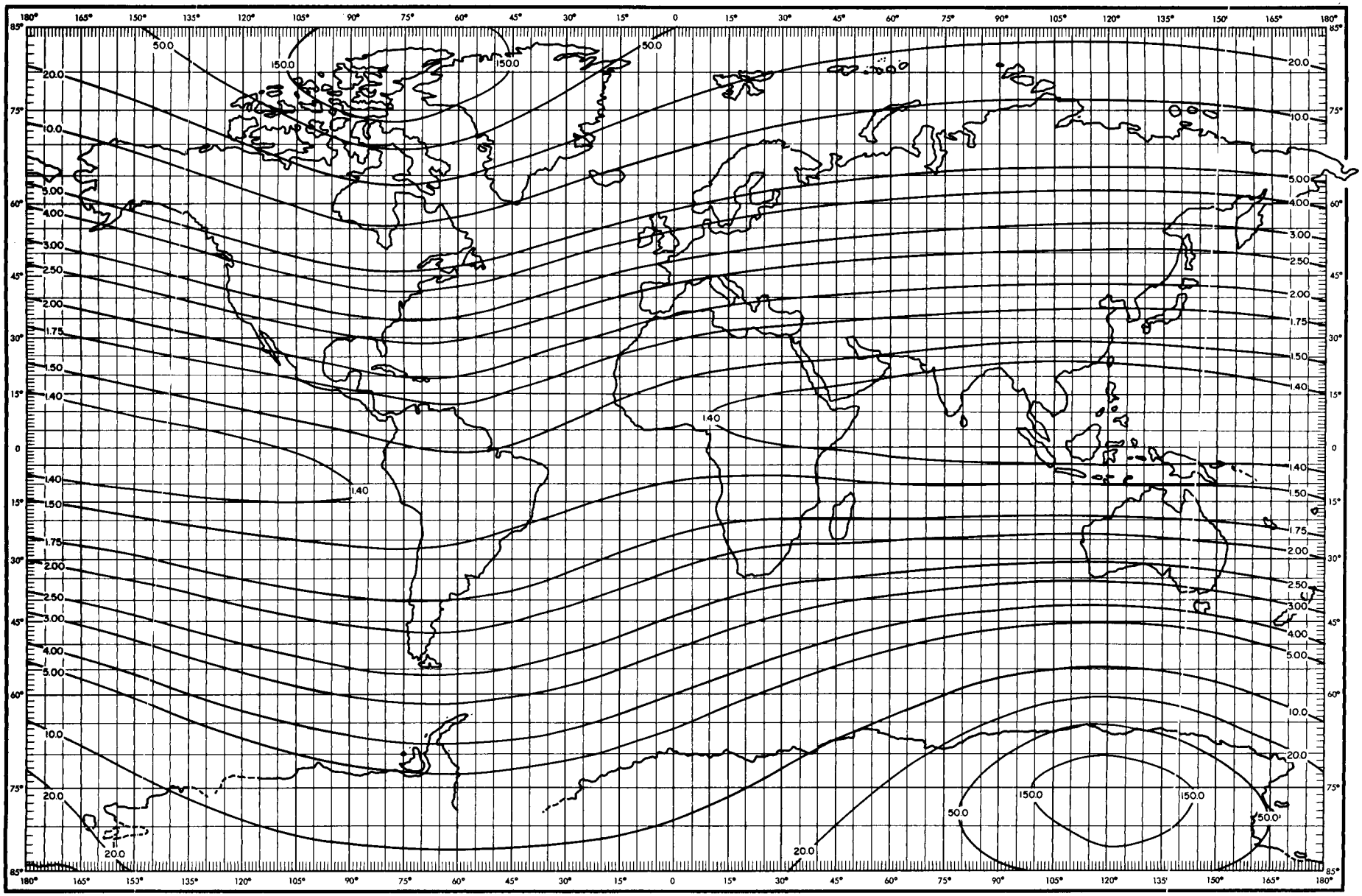


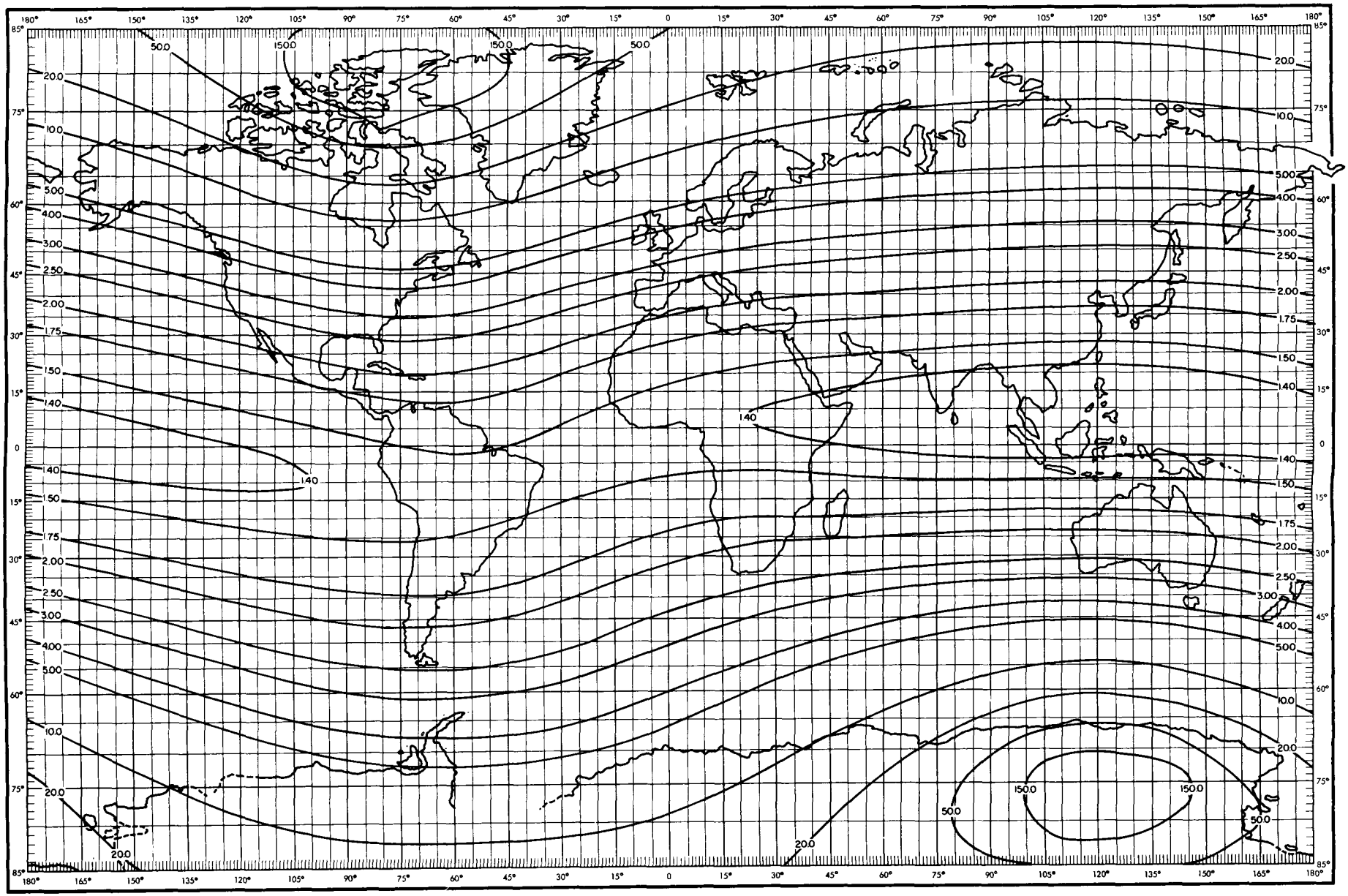

ALTITUDE 2300 KM

LINES OF CONSTANT L (earth radii)



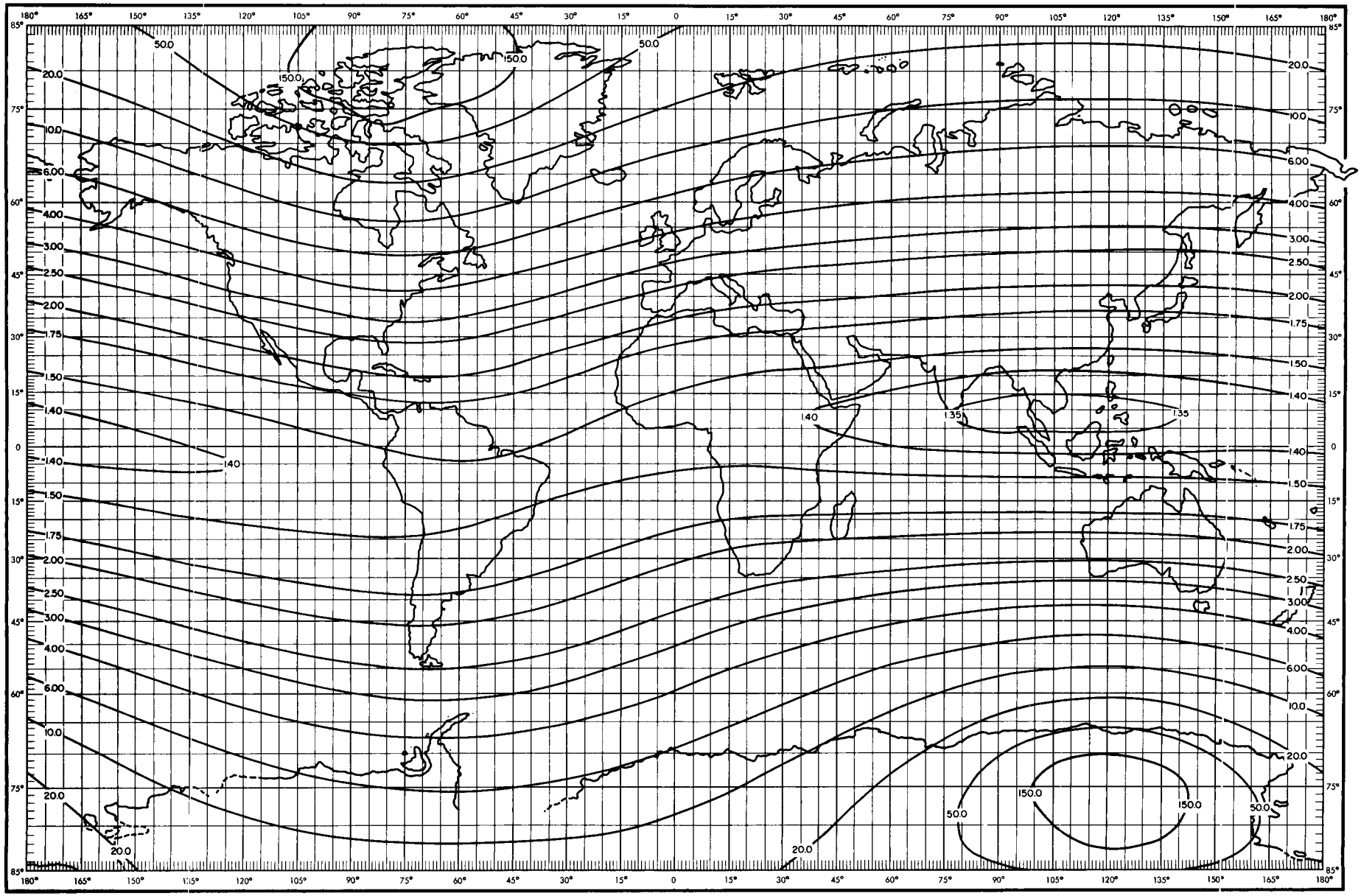

ALTITUDE 2400

# LINES OF CONSTANT L (earth radii)



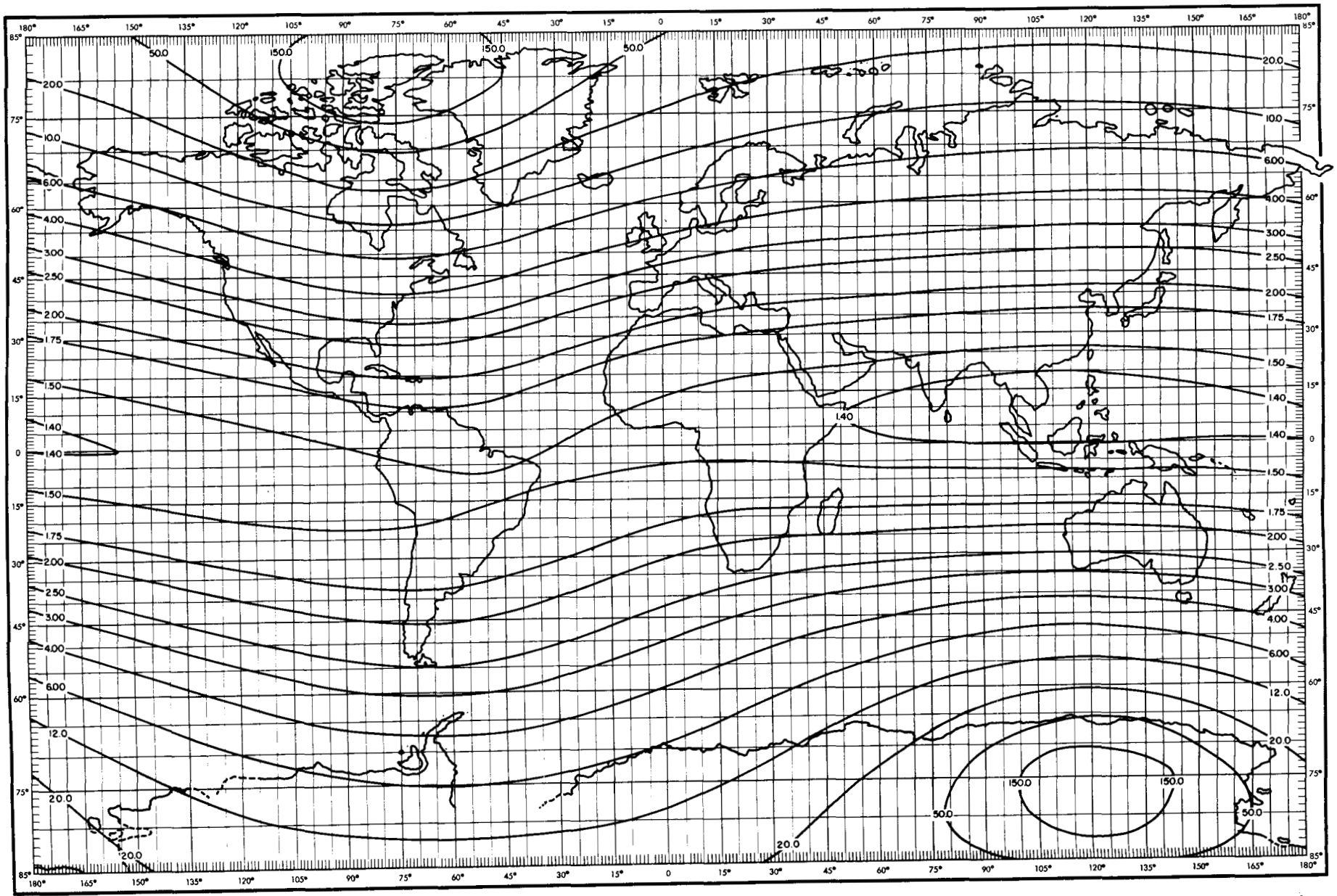

ALTITUDE 2500 KM

# LINES OF CONSTANT L (earth radii)



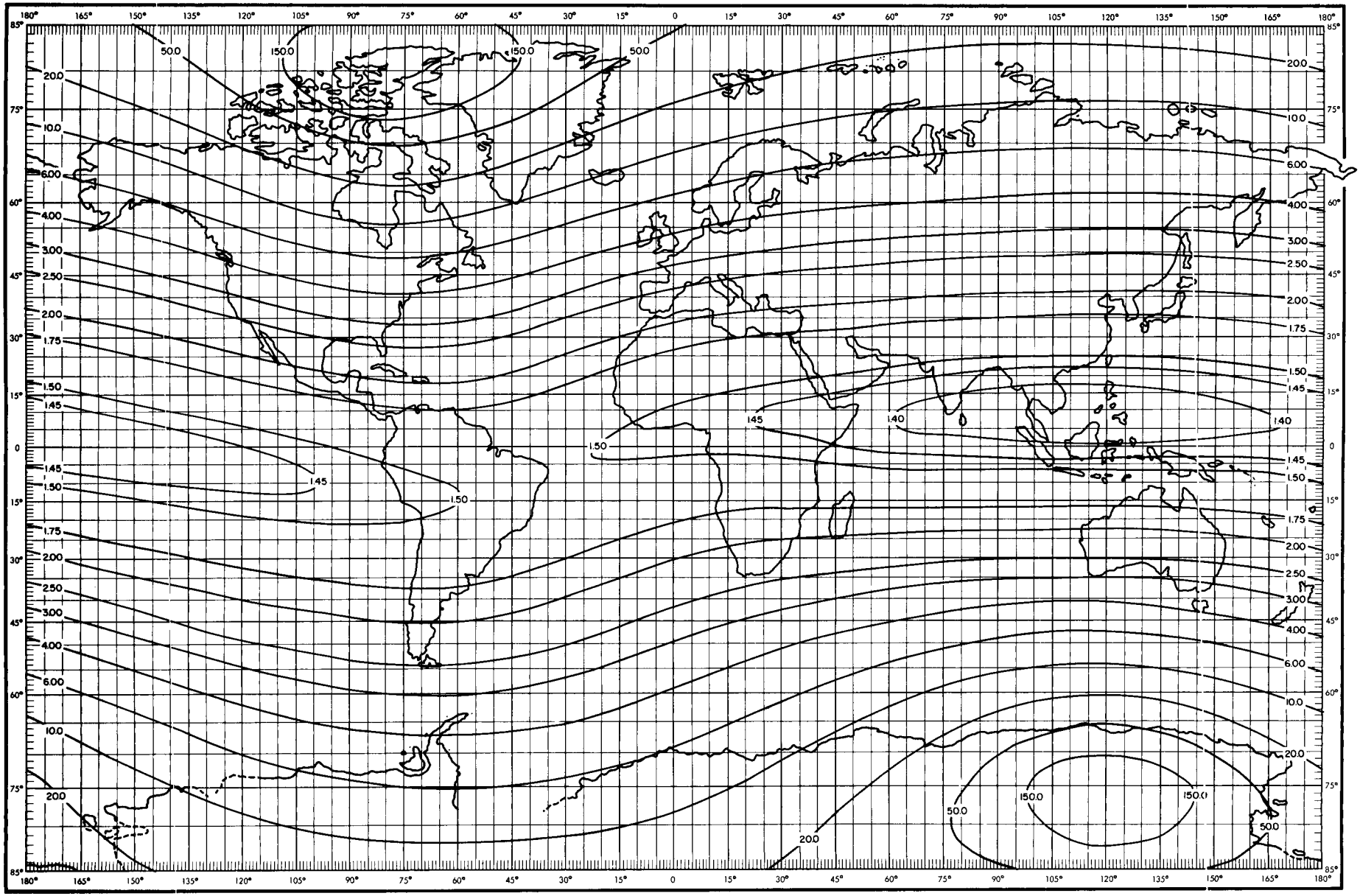

ALTITUDE 2600 KM

LINES OF CONSTANT L (earth radii)



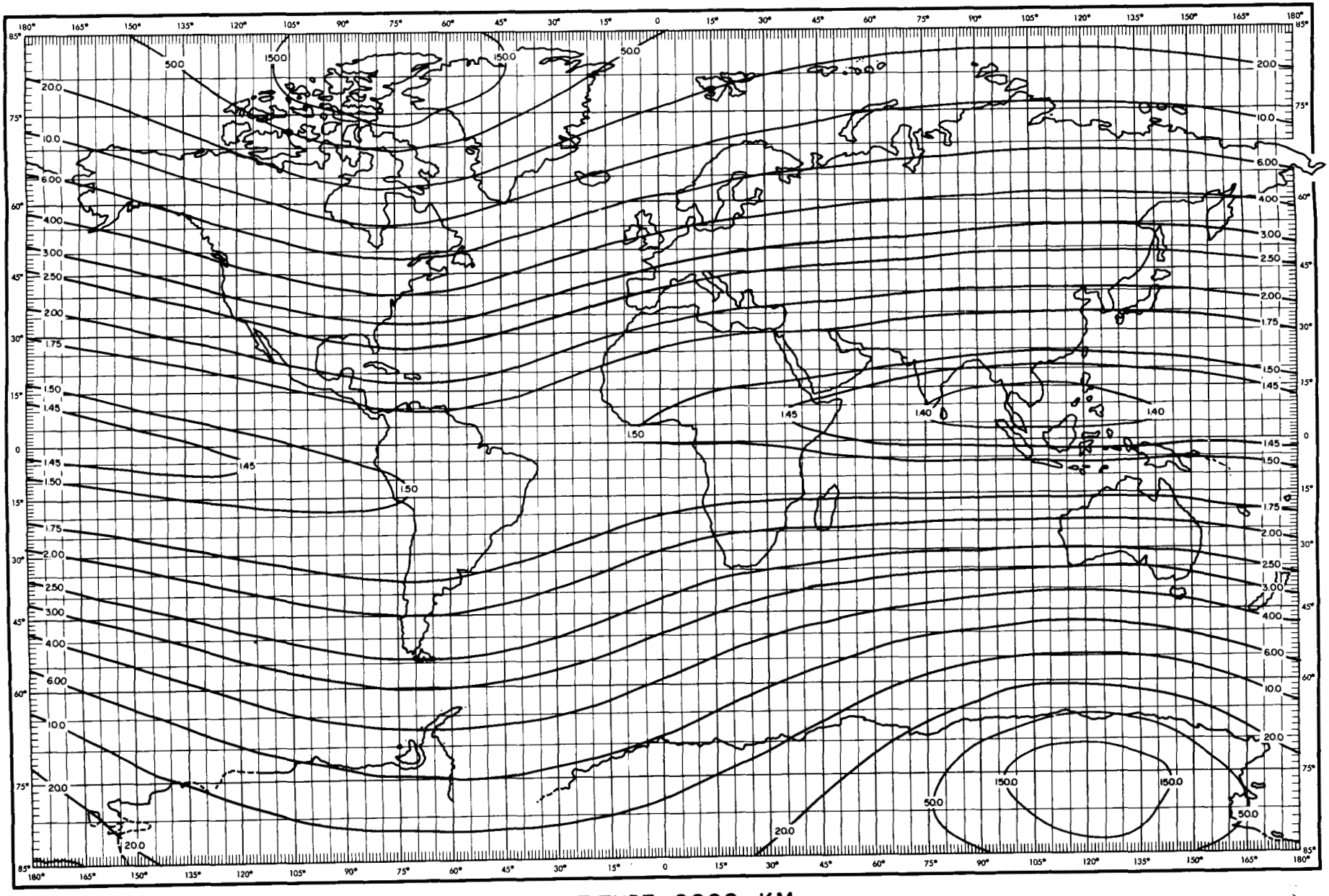

ALTITUDE 2700 KM

# LINES OF CONSTANT L (earth radii)



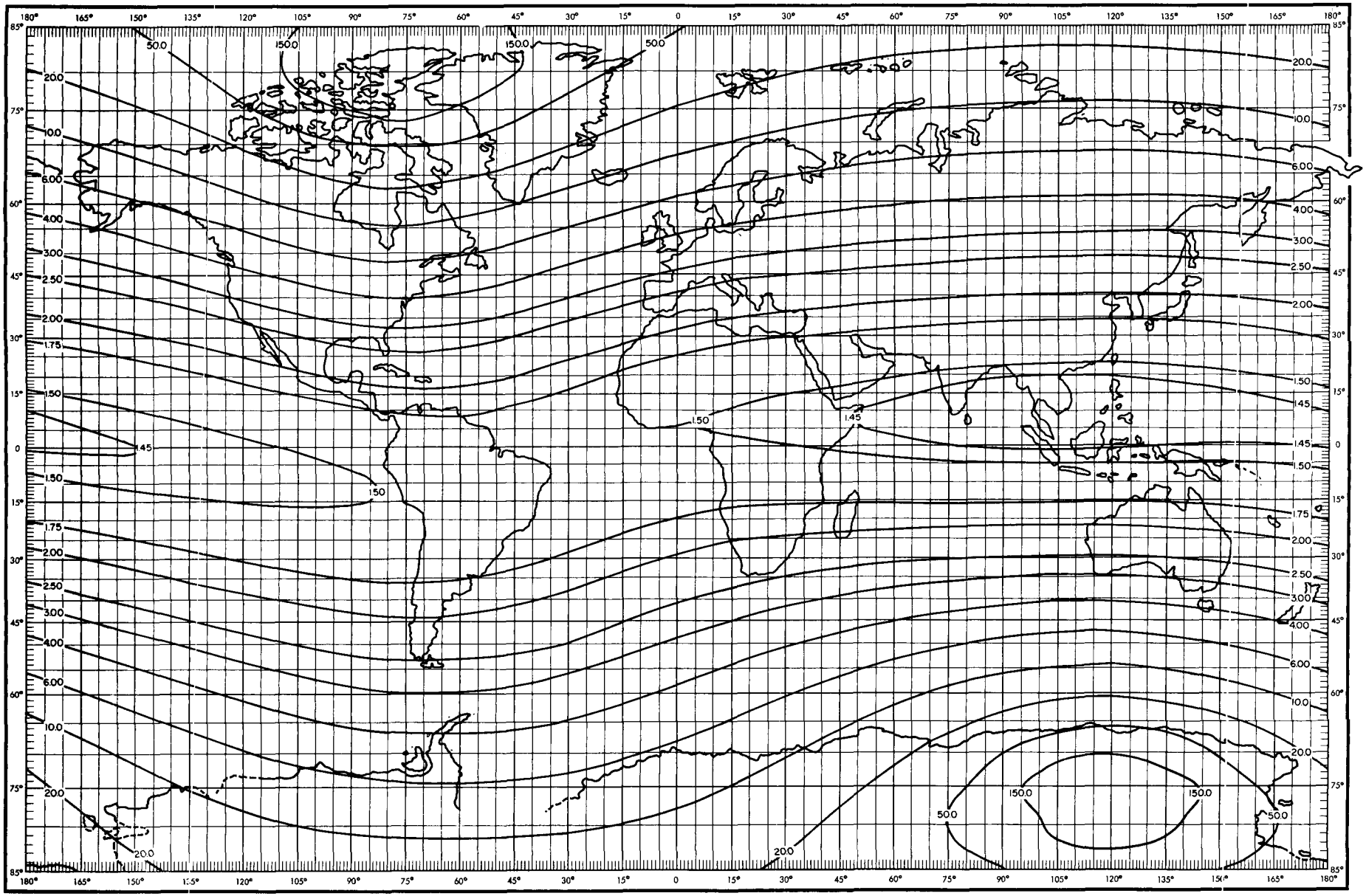

ALTITUDE 2800 KM

# LINES OF CONSTANT L (earth radii)



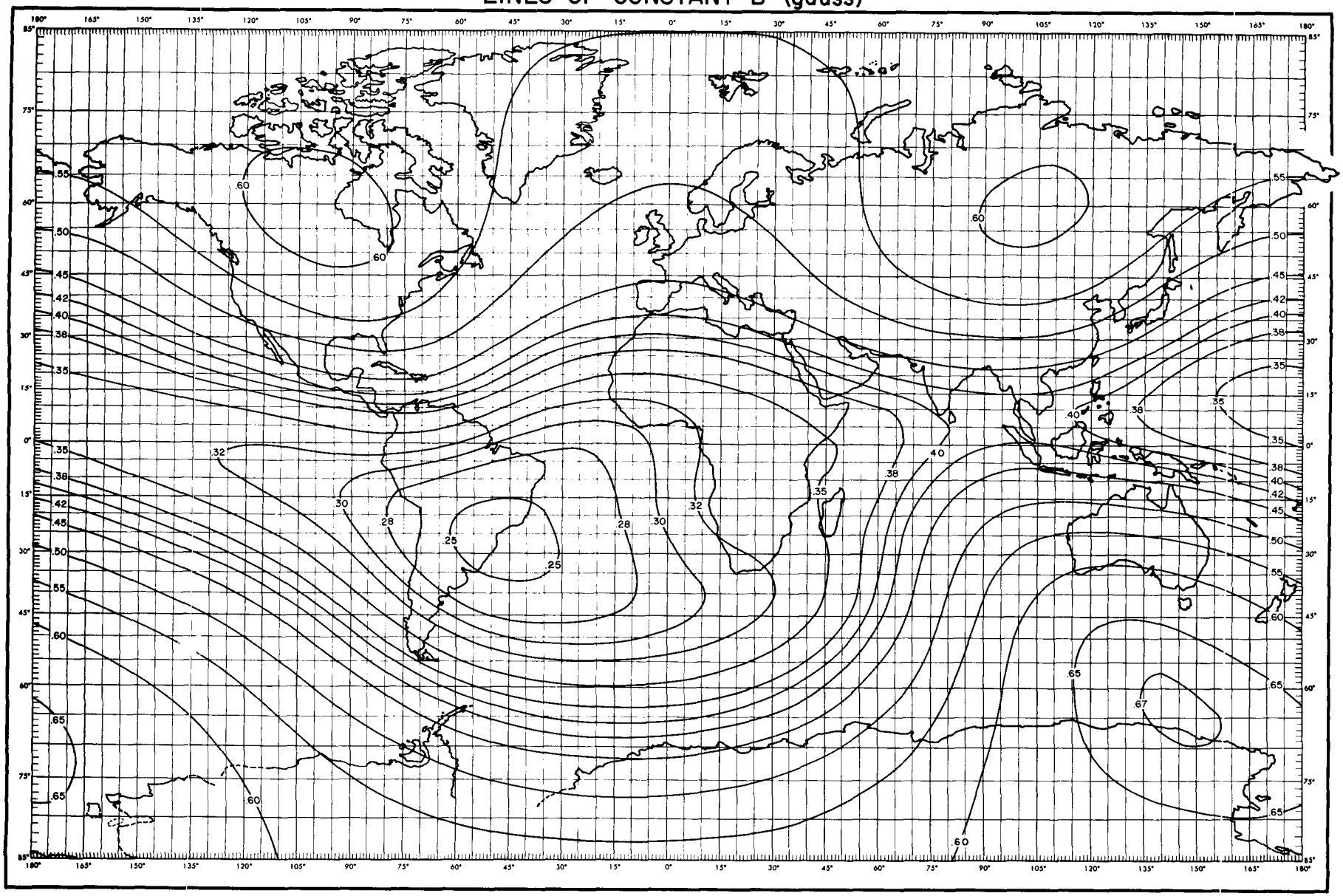

ALTITUDE 2900 KM

LINES OF CONSTANT L (earth radii)



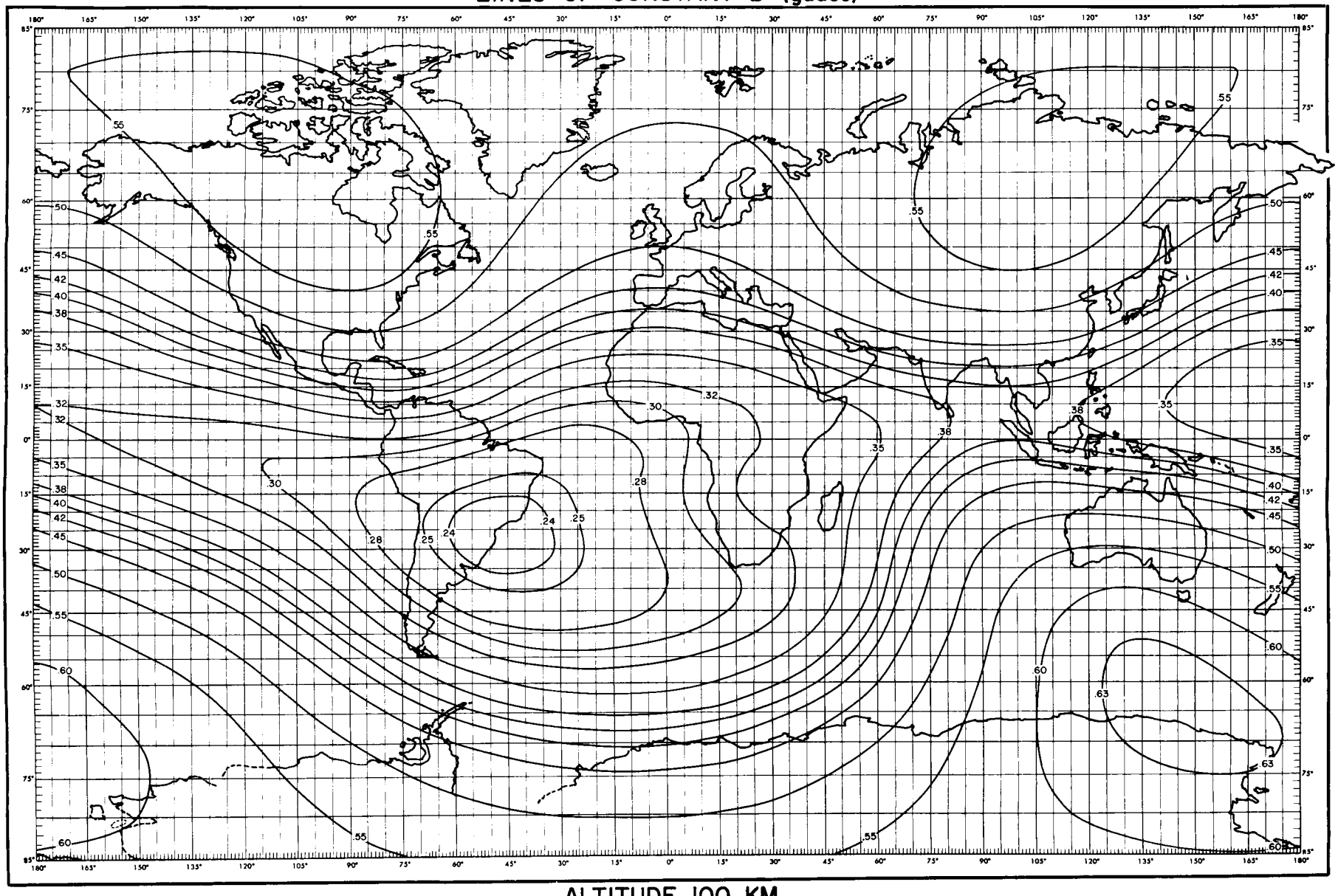

ALTITUDE 3000 KM

# LINES OF CONSTANT B (gauss)



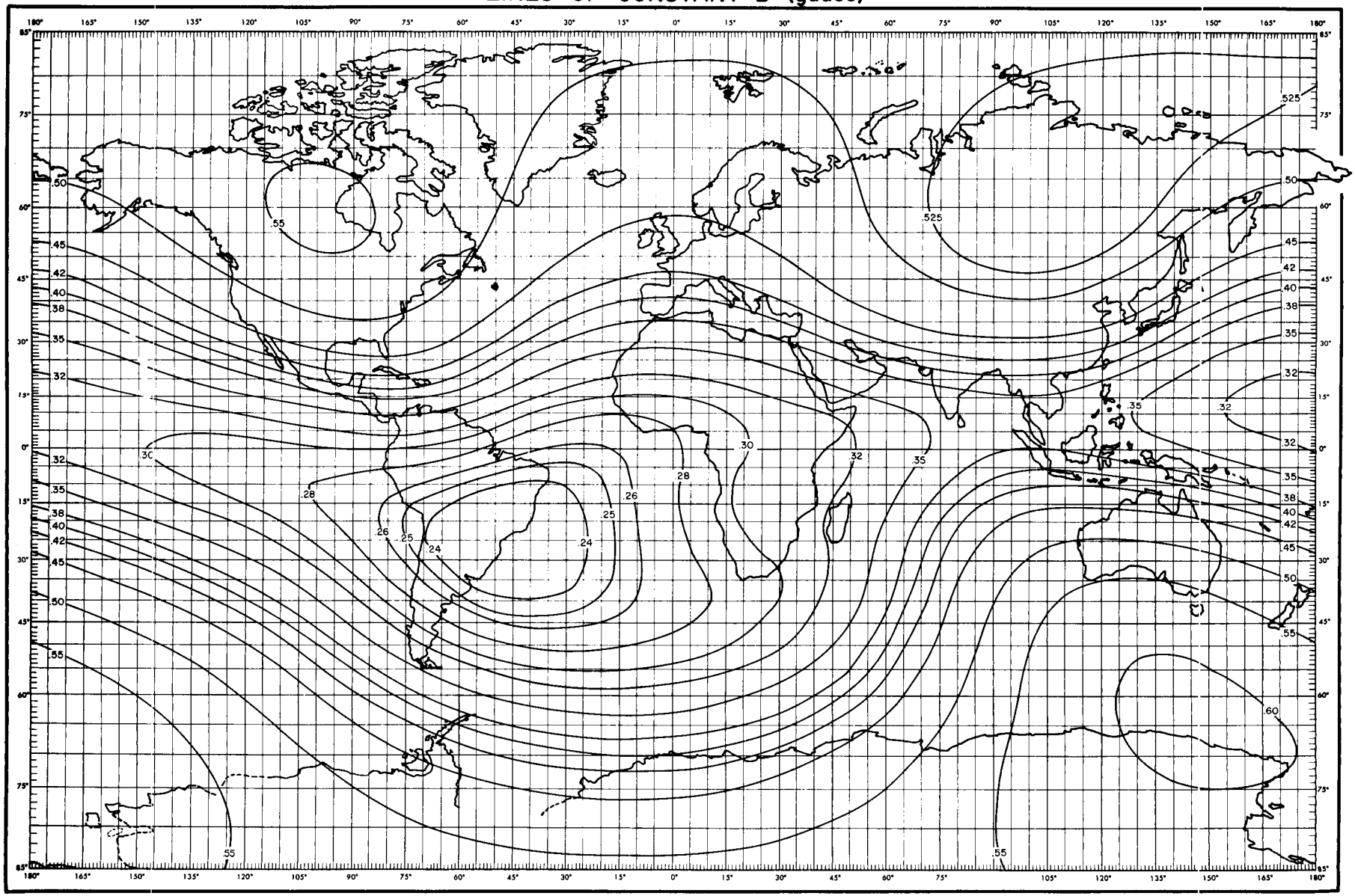

ALTITUDE 0 KM

# LINES OF CONSTANT B (gauss)



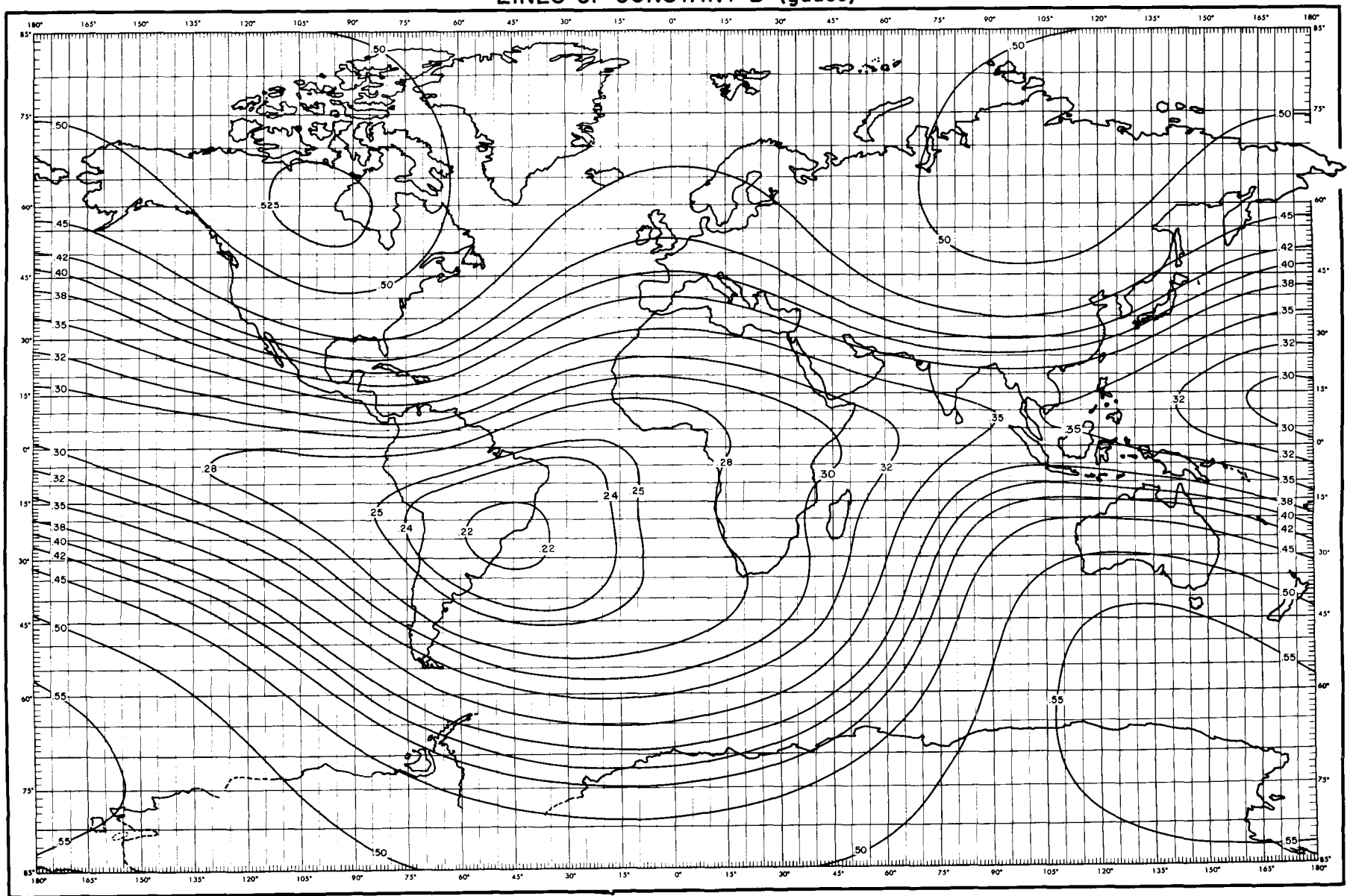

ALTITUDE 100 KM

LINES OF CONSTANT B (gauss)



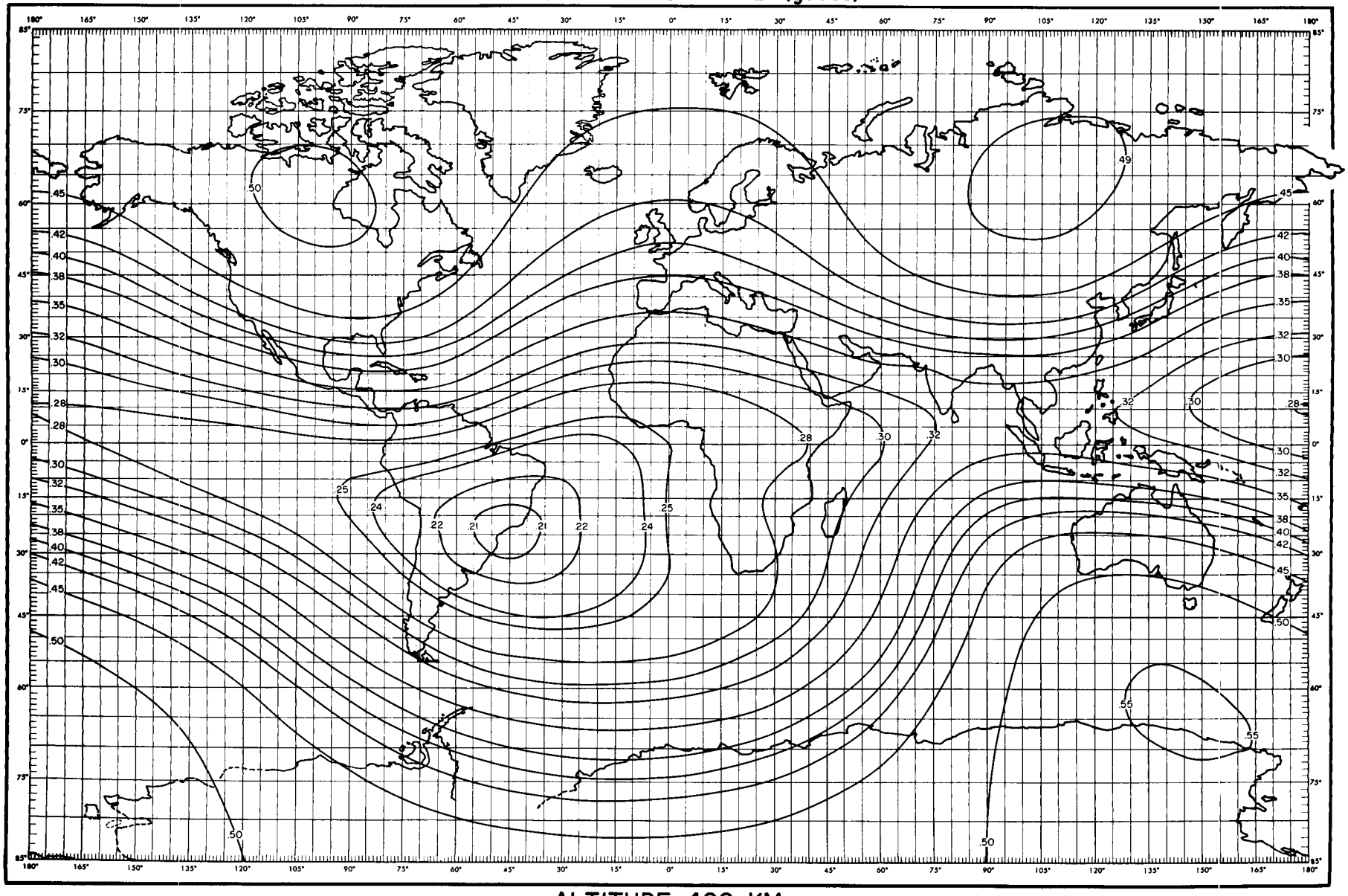

ALTITUDE 200 KM

# LINES OF CONSTANT B (gauss)



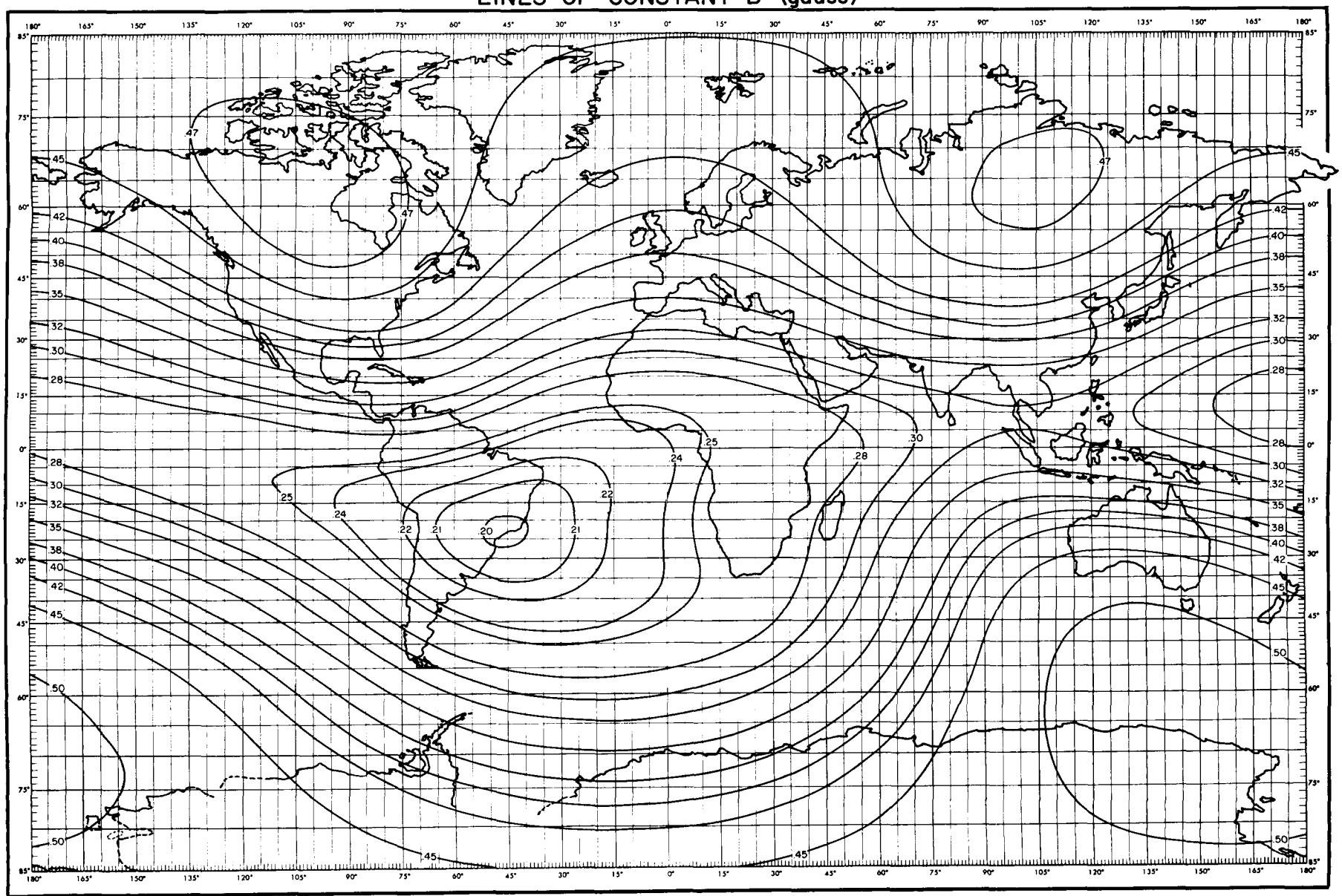

ALTITUDE 300 KM

# LINES OF CONSTANT B (gauss)



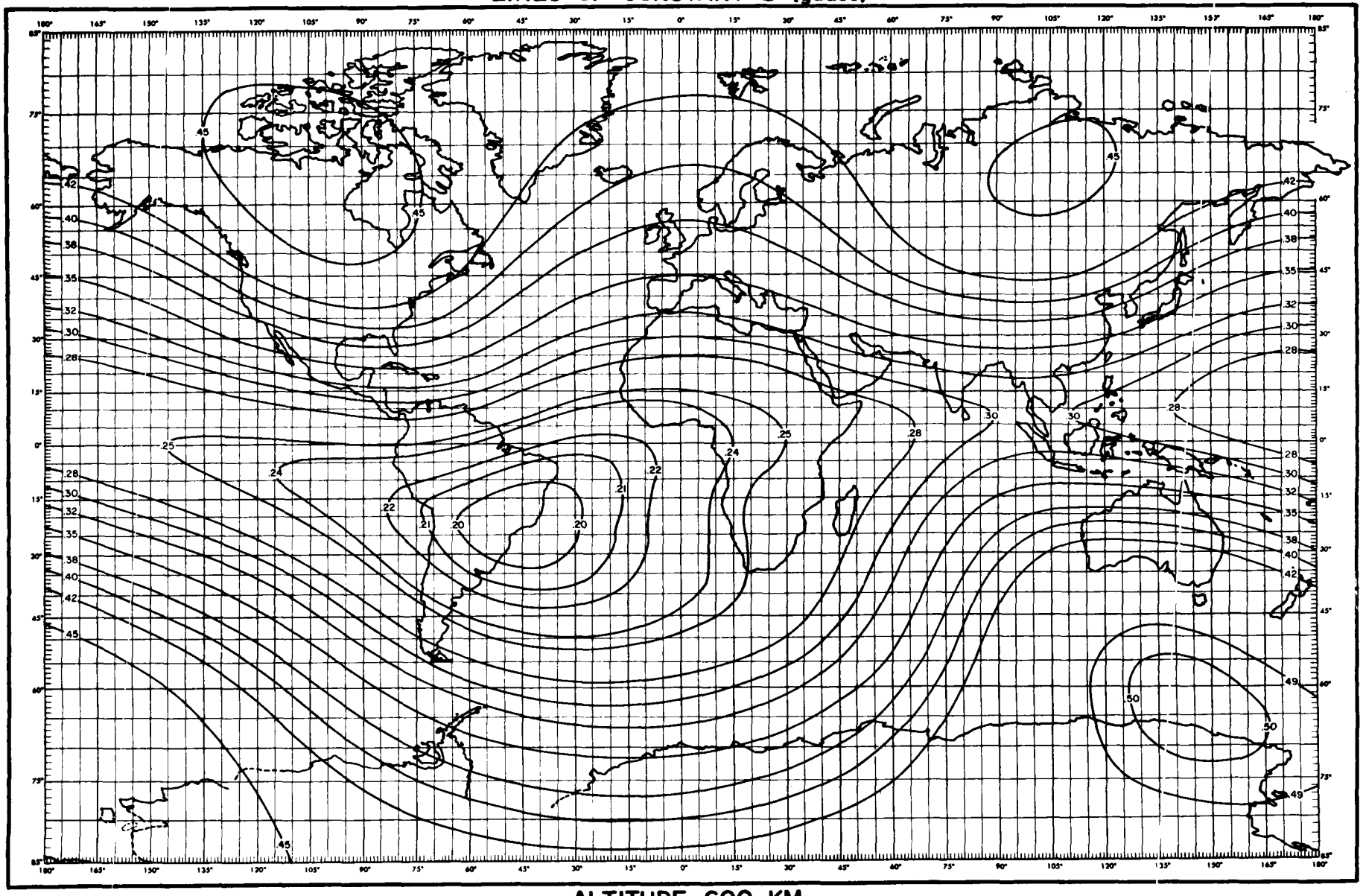

ALTITUDE 400 KM

# LINES OF CONSTANT B (gauss)



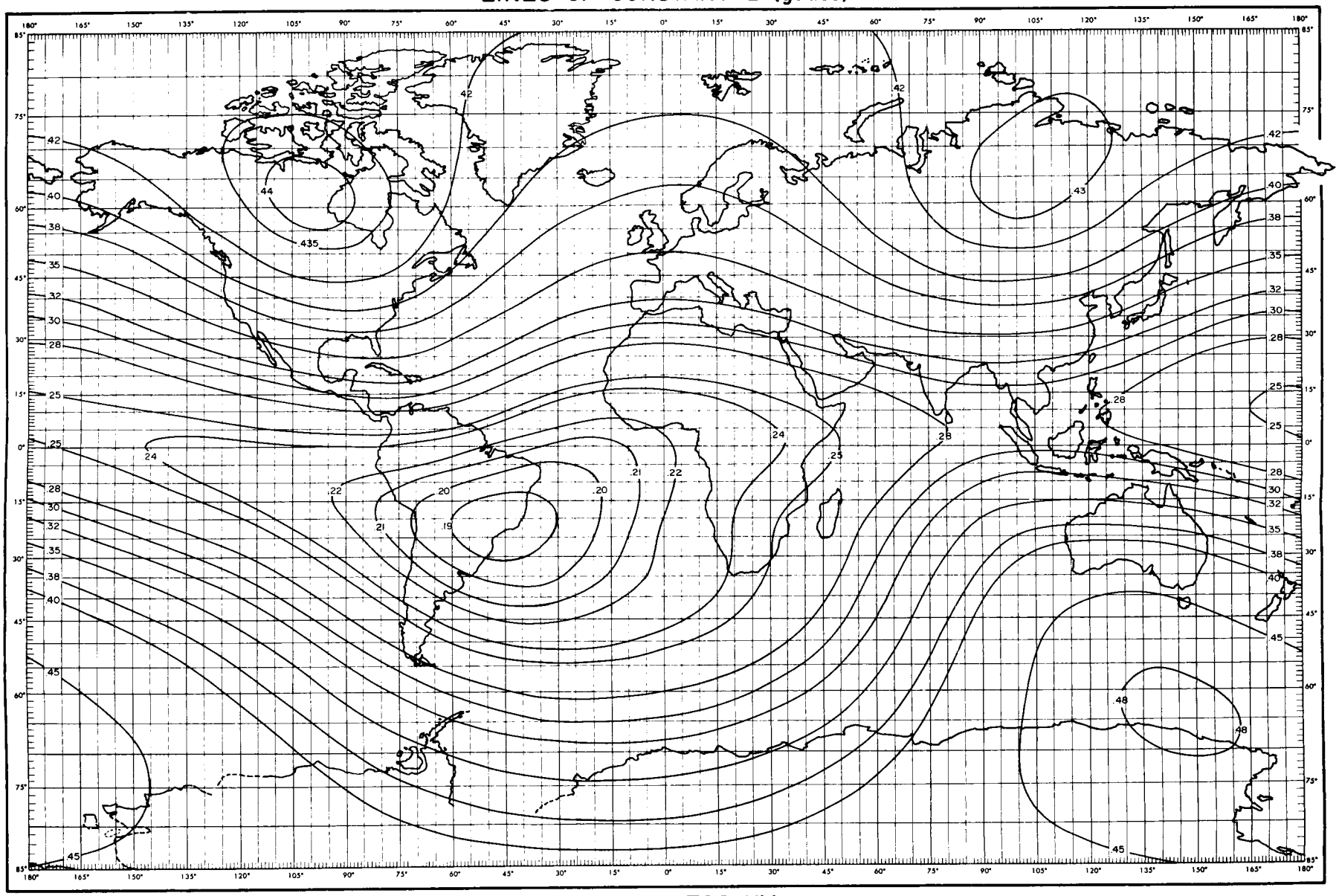

ALTITUDE 500 KM

# LINES OF CONSTANT B (gauss)



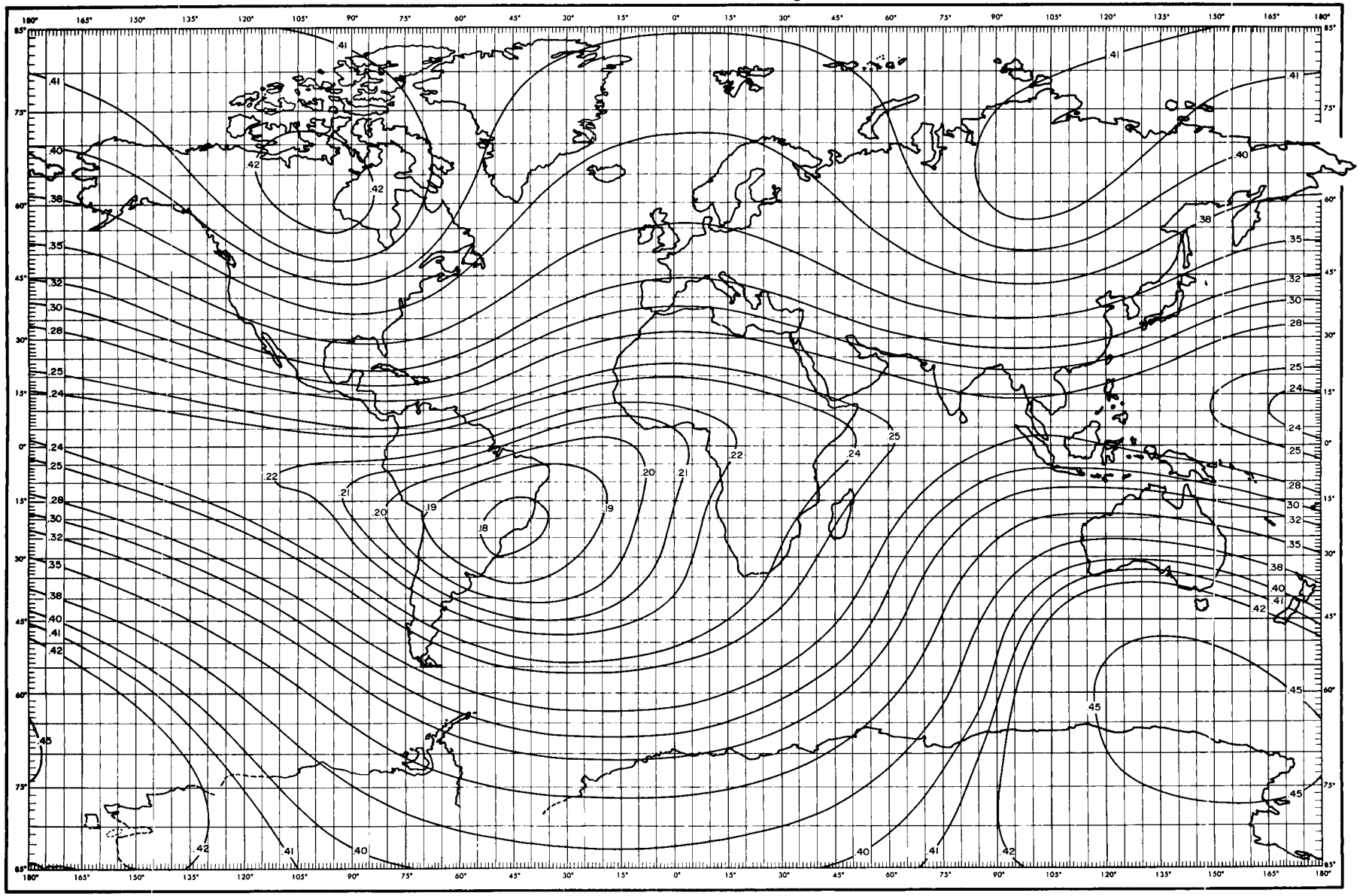

ALTITUDE 600 KM

# LINES OF CONSTANT B (gauss)



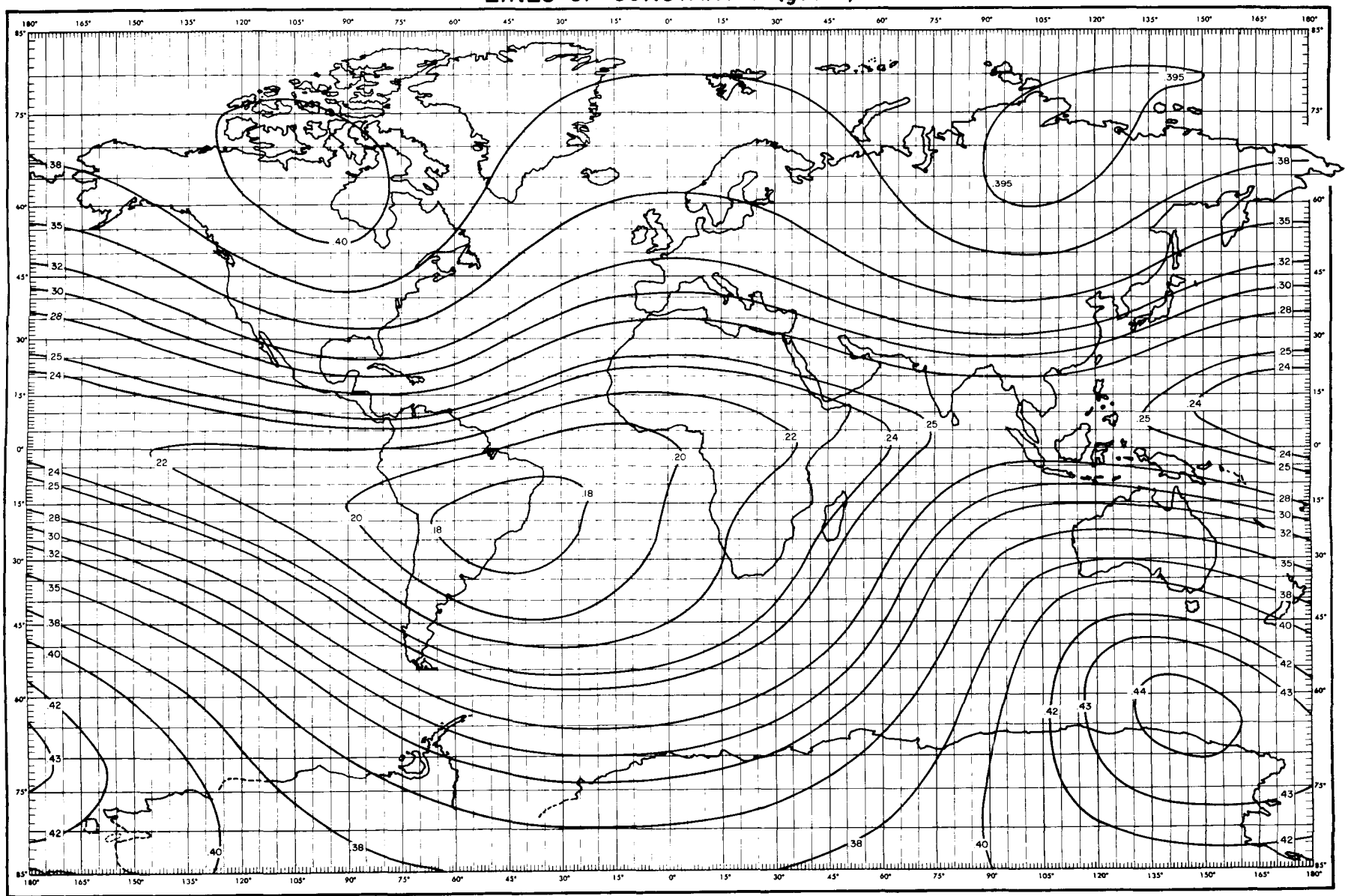

ALTITUDE 700 KM

LINES OF CONSTANT B (gauss)



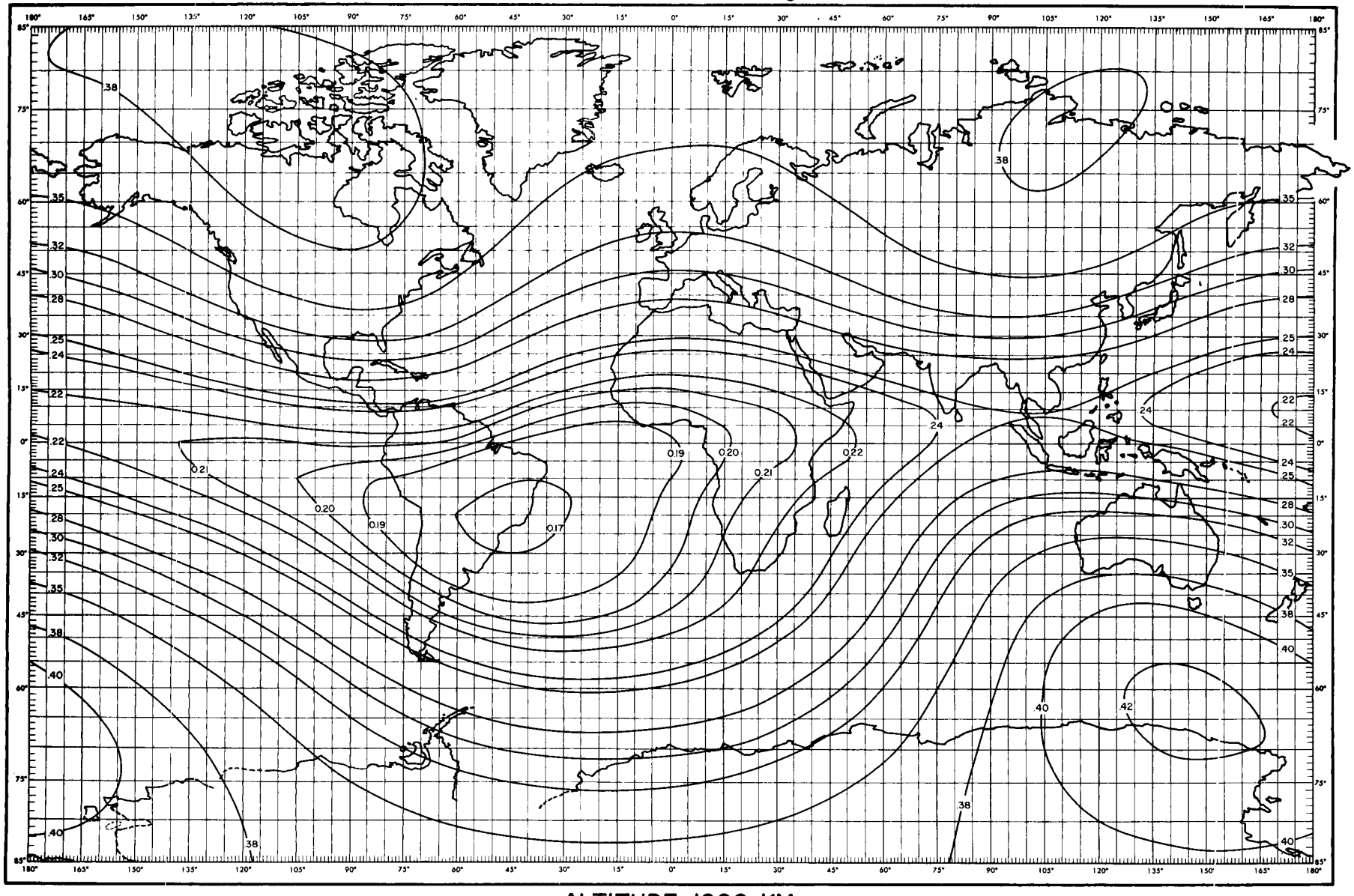
ALTITUDE 800 KM

# LINES OF CONSTANT B (gauss)



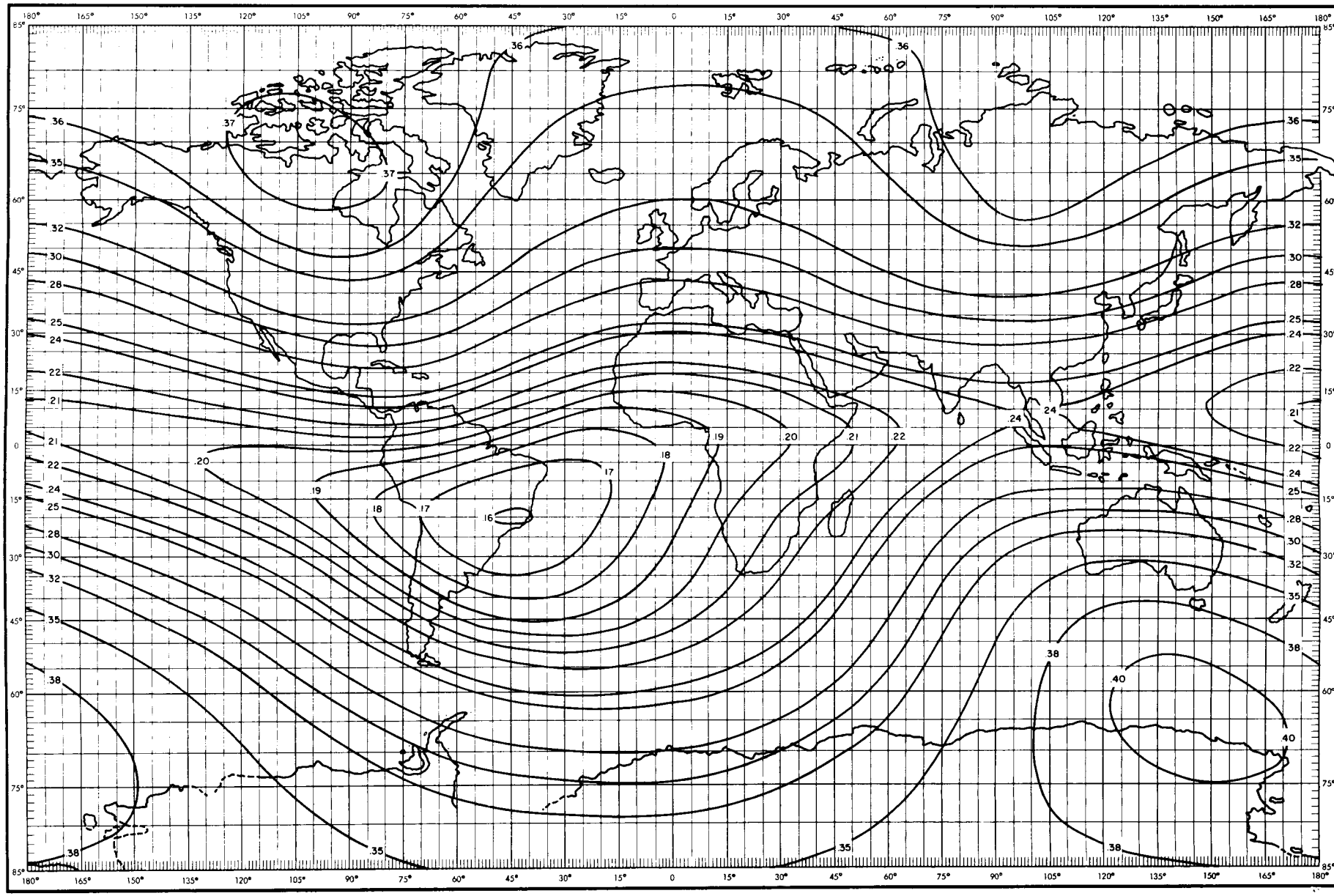

ALTITUDE 900 KM

# LINES OF CONSTANT B (gauss)



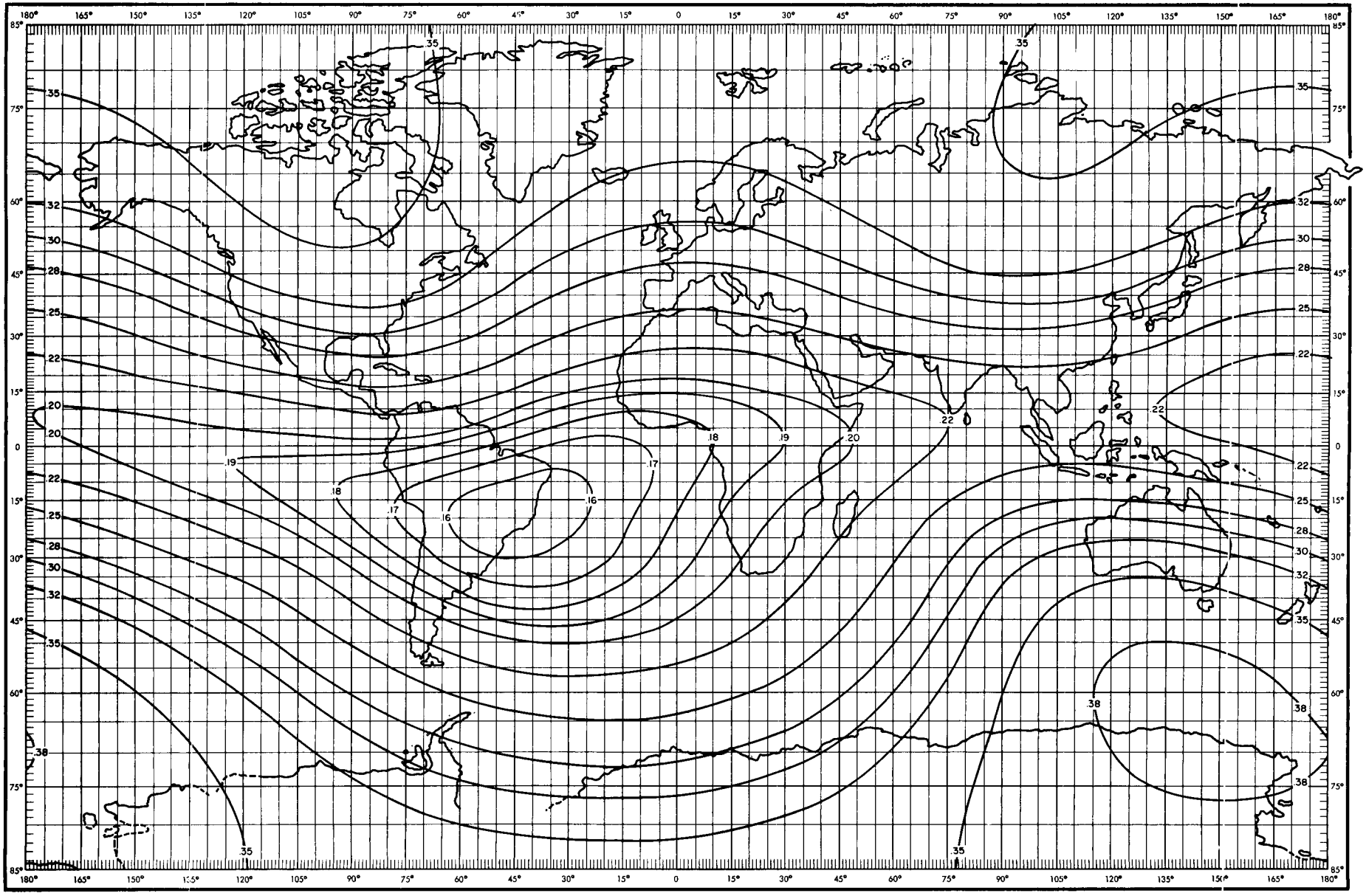

ALTITUDE 1000 KM

LINES OF CONSTANT B (gauss)



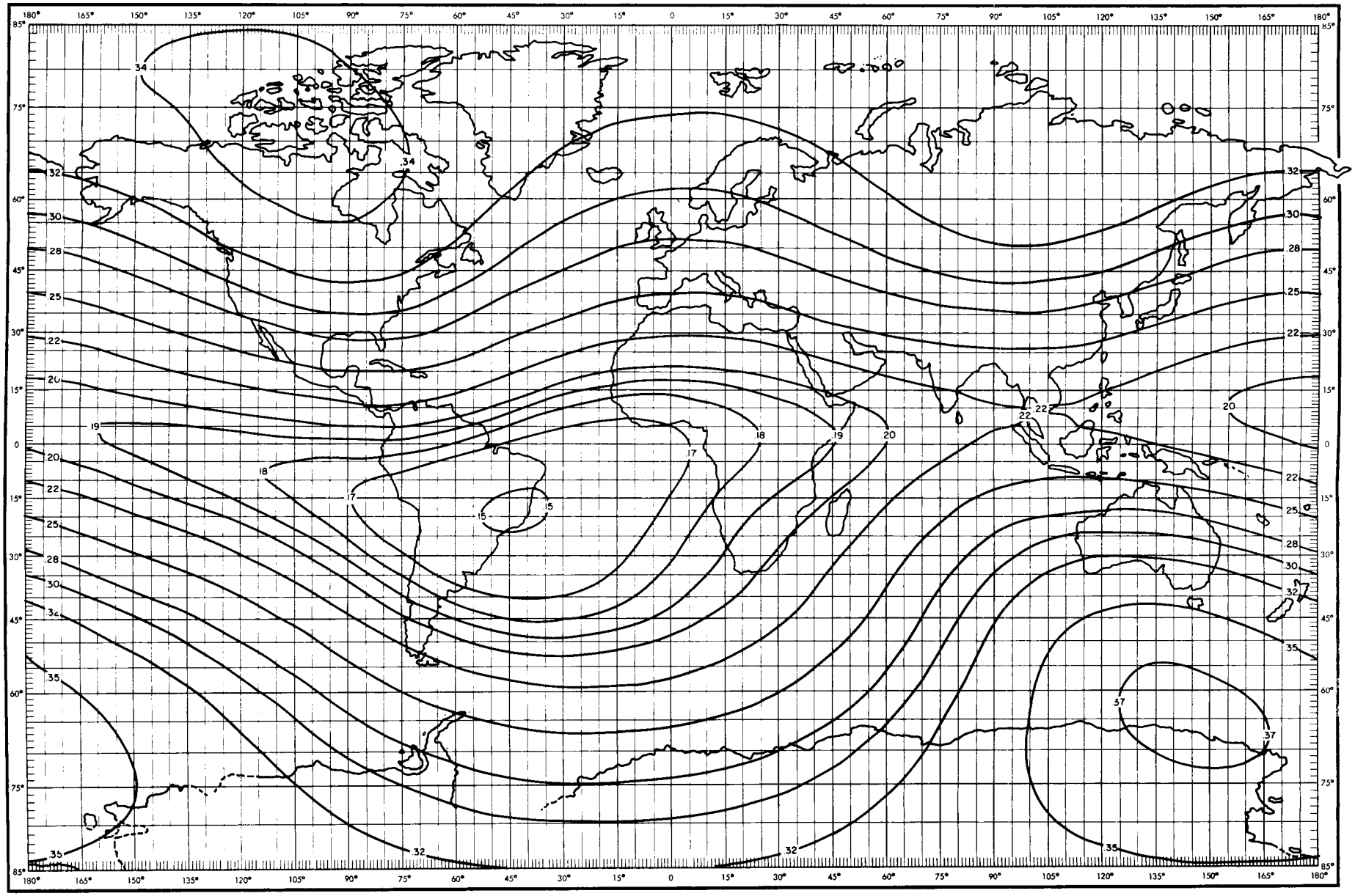
ALTITUDE 1100 KM

LINES OF CONSTANT B (gauss)



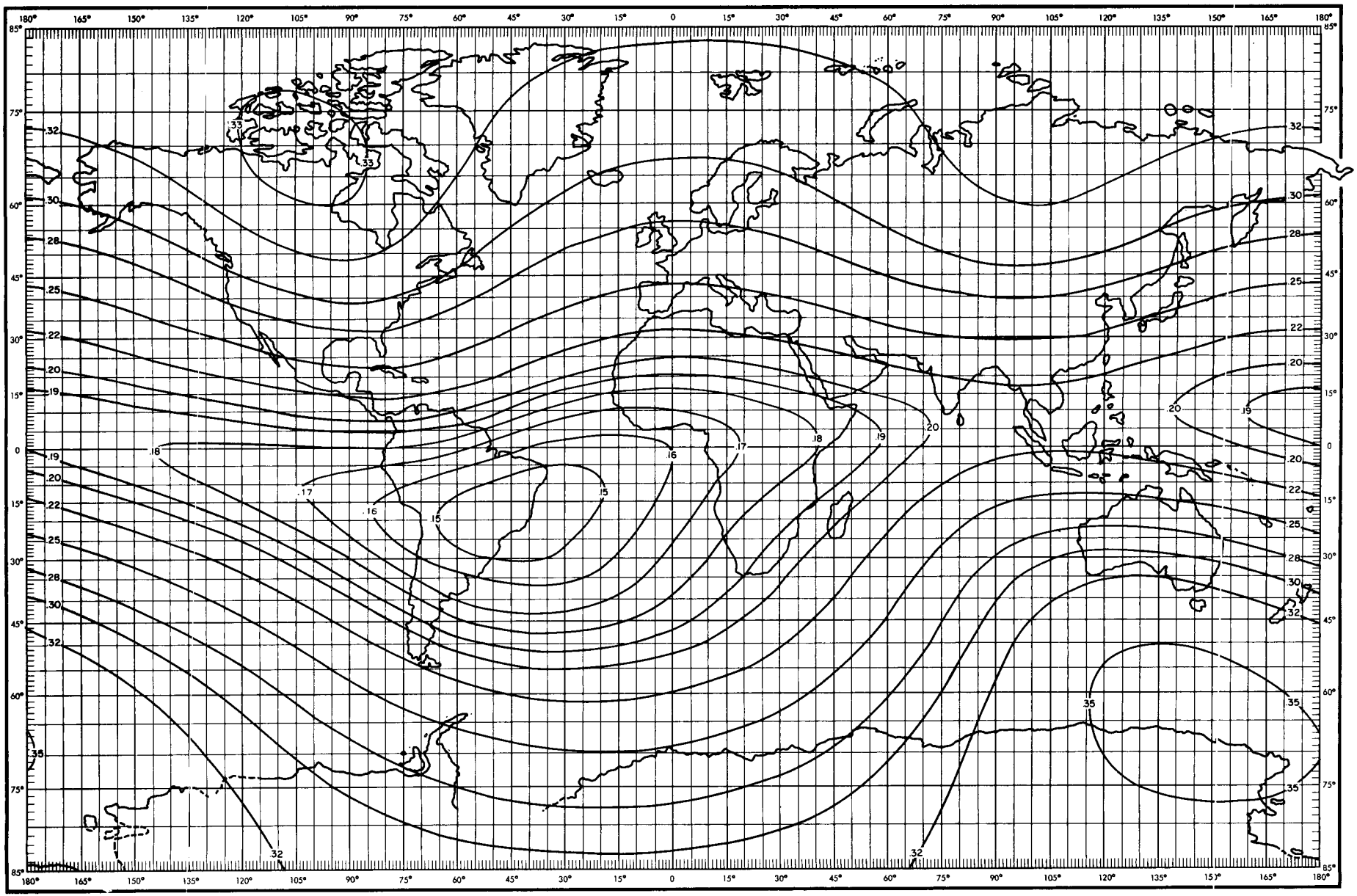

ALTITUDE 1200 KM

# LINES OF CONSTANT B (gauss)



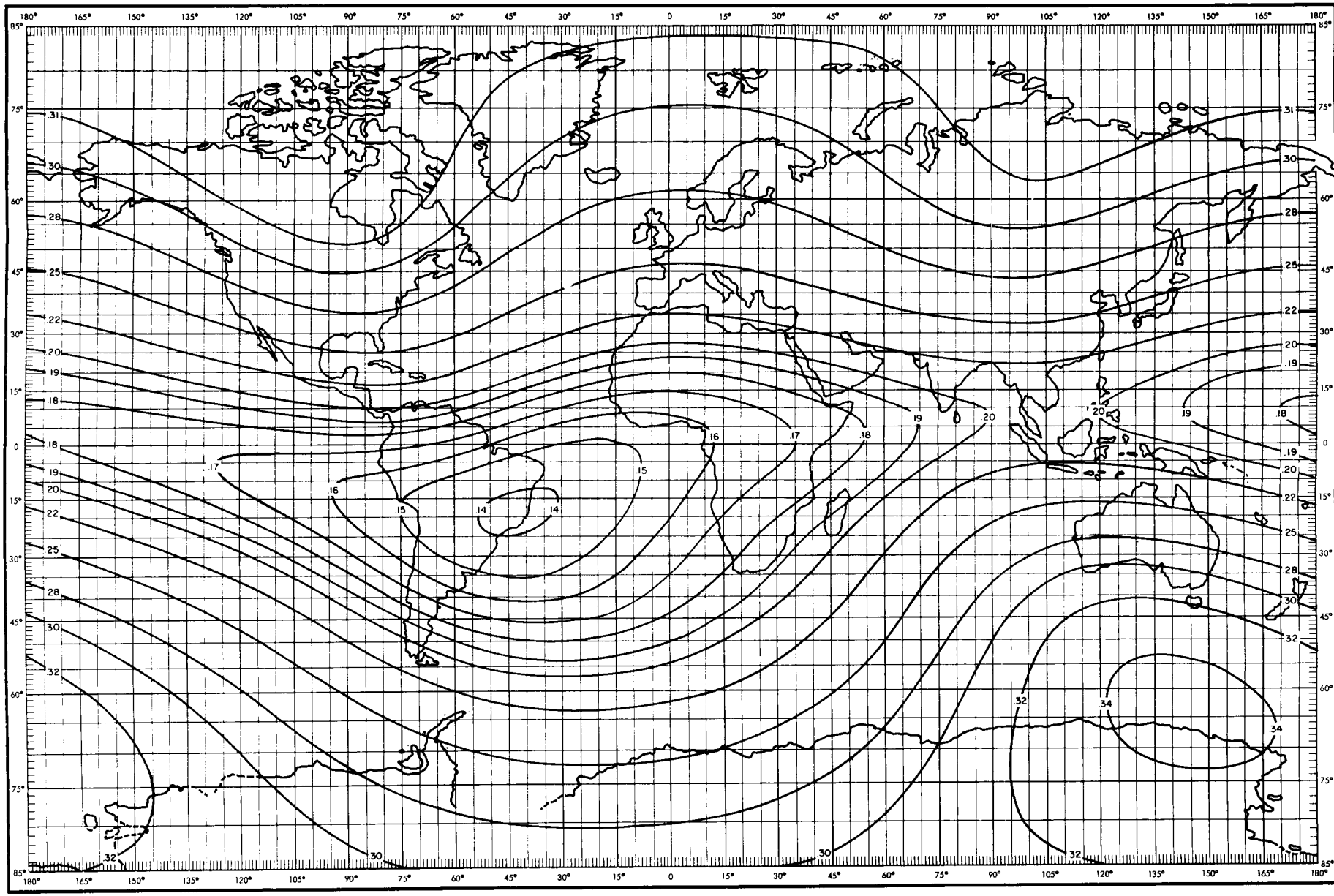

ALTITUDE 1300KM

## LINES OF CONSTANT B (gauss)



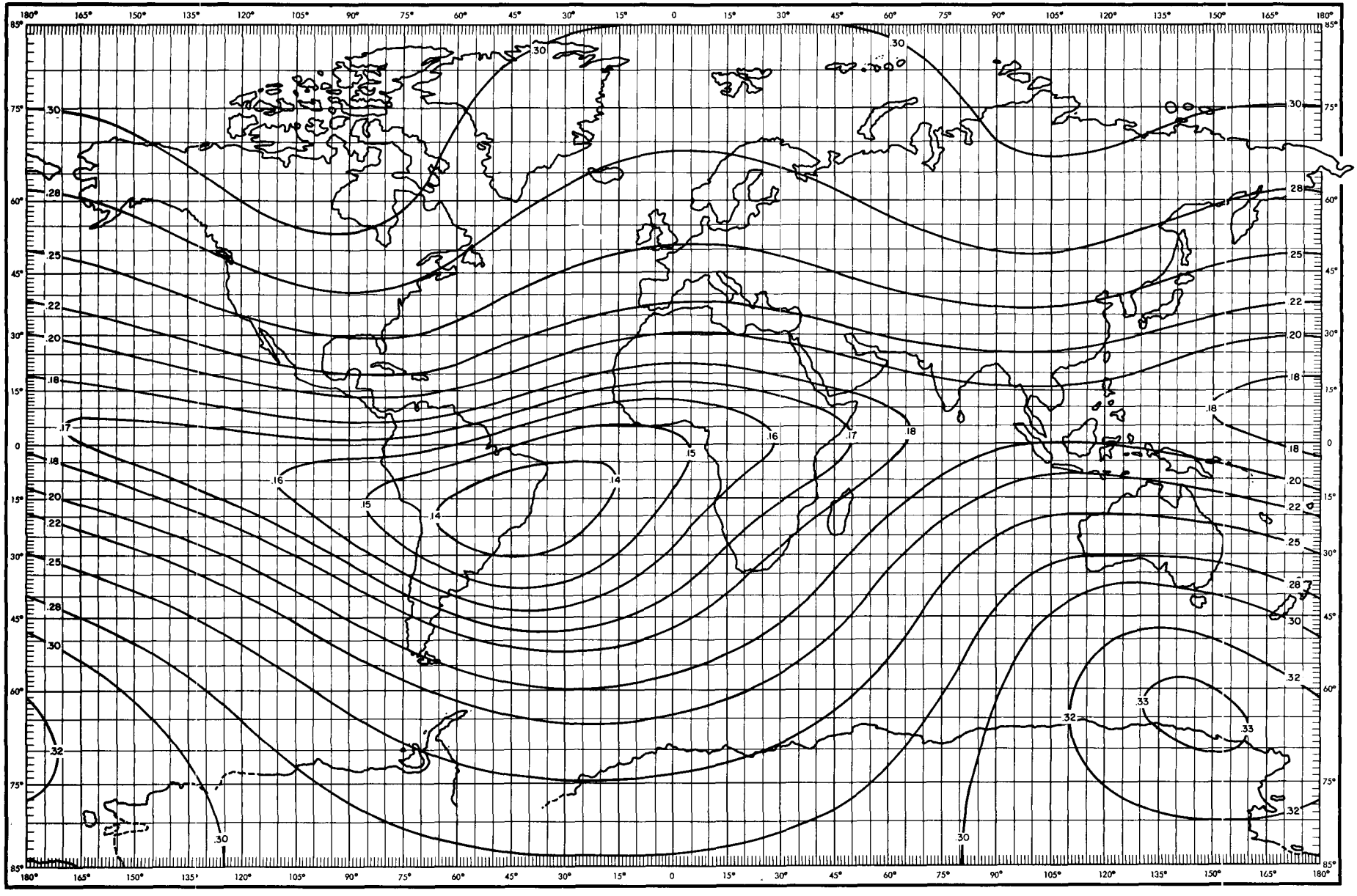

ALTITUDE 1400 KM

LINES OF CONSTANT B (gauss)



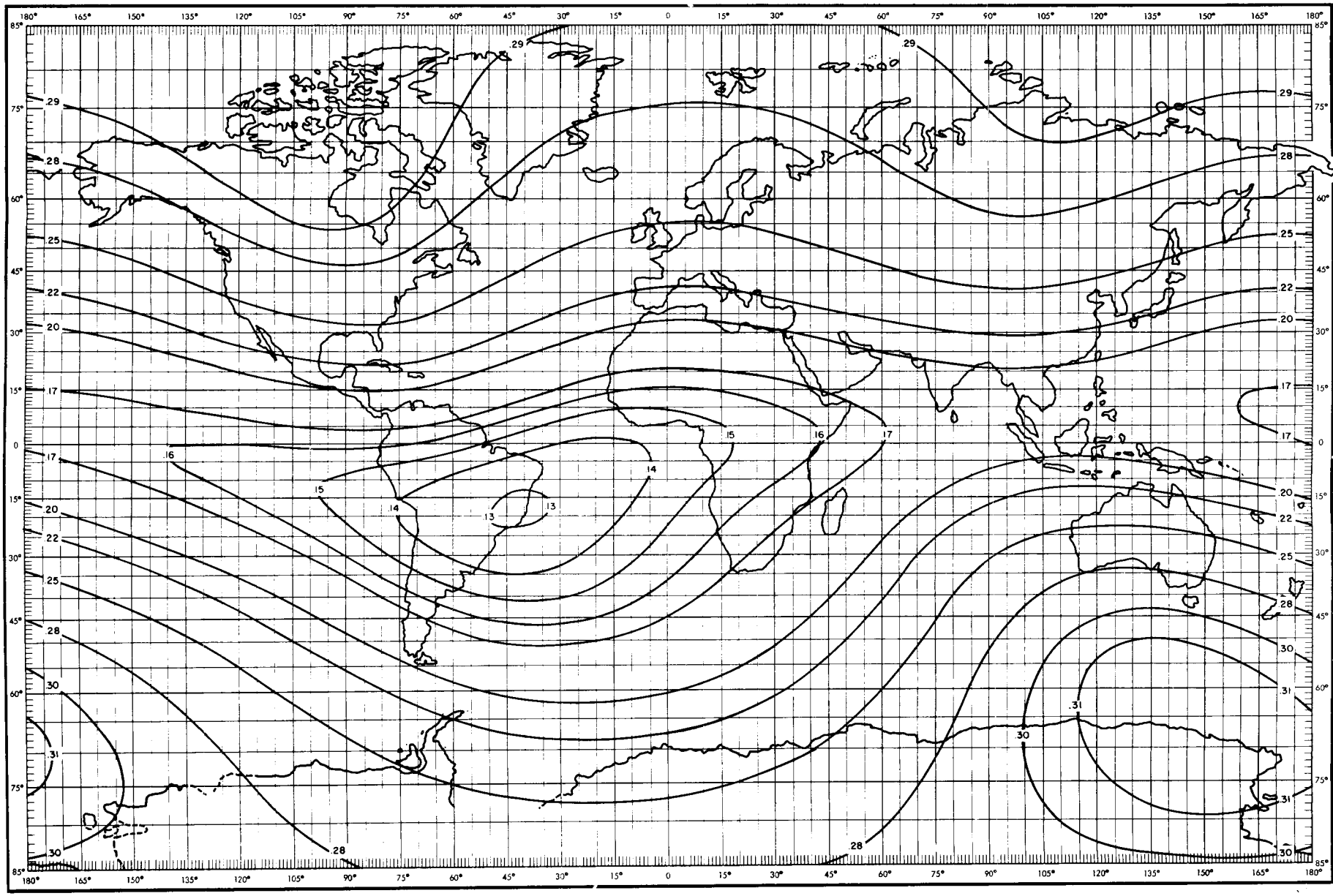

ALTITUDE 1500 KM

LINES OF CONSTANT B (gauss)



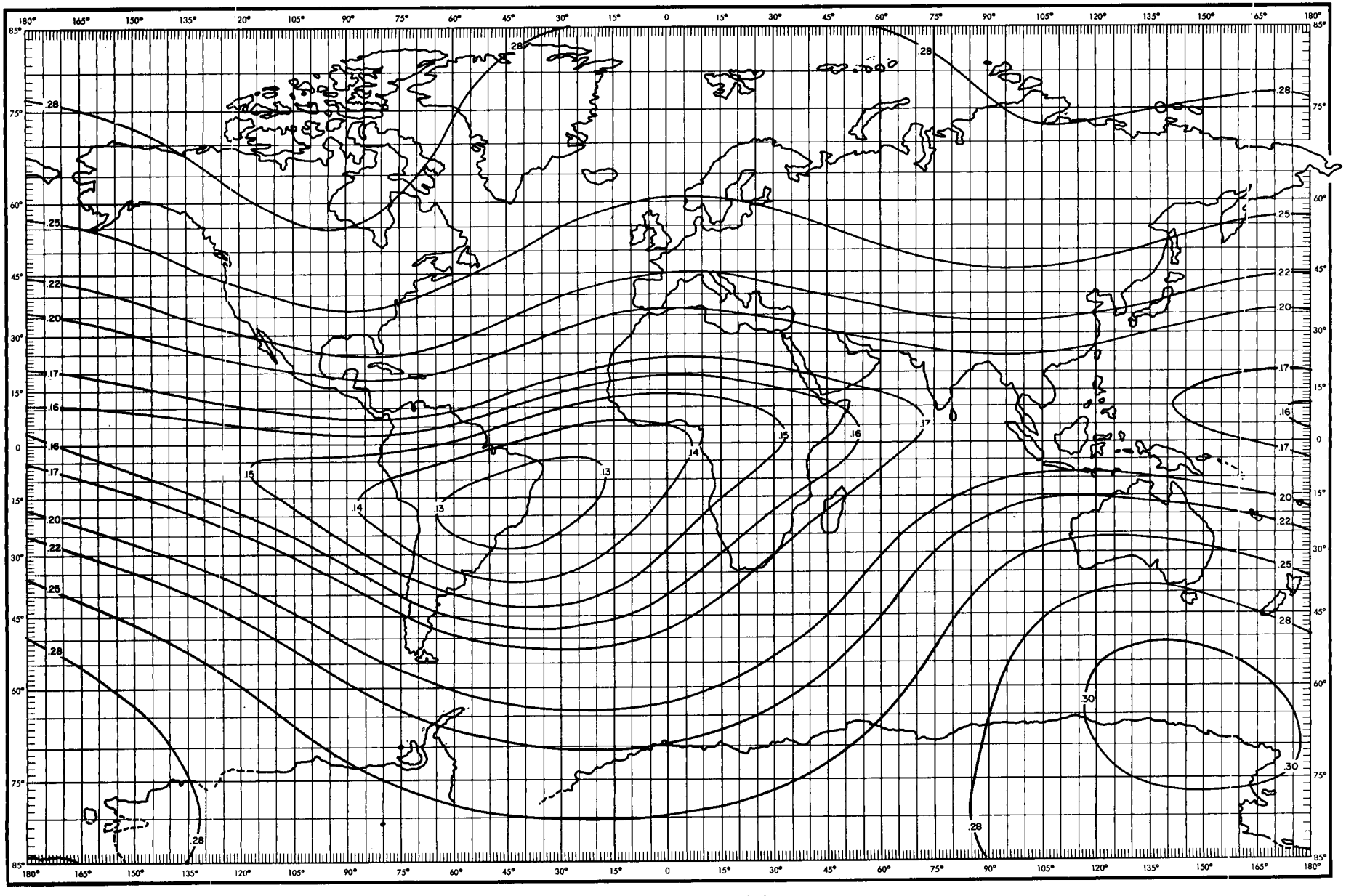

ALTITUDE 1600 KM

# LINES OF CONSTANT B (gauss)



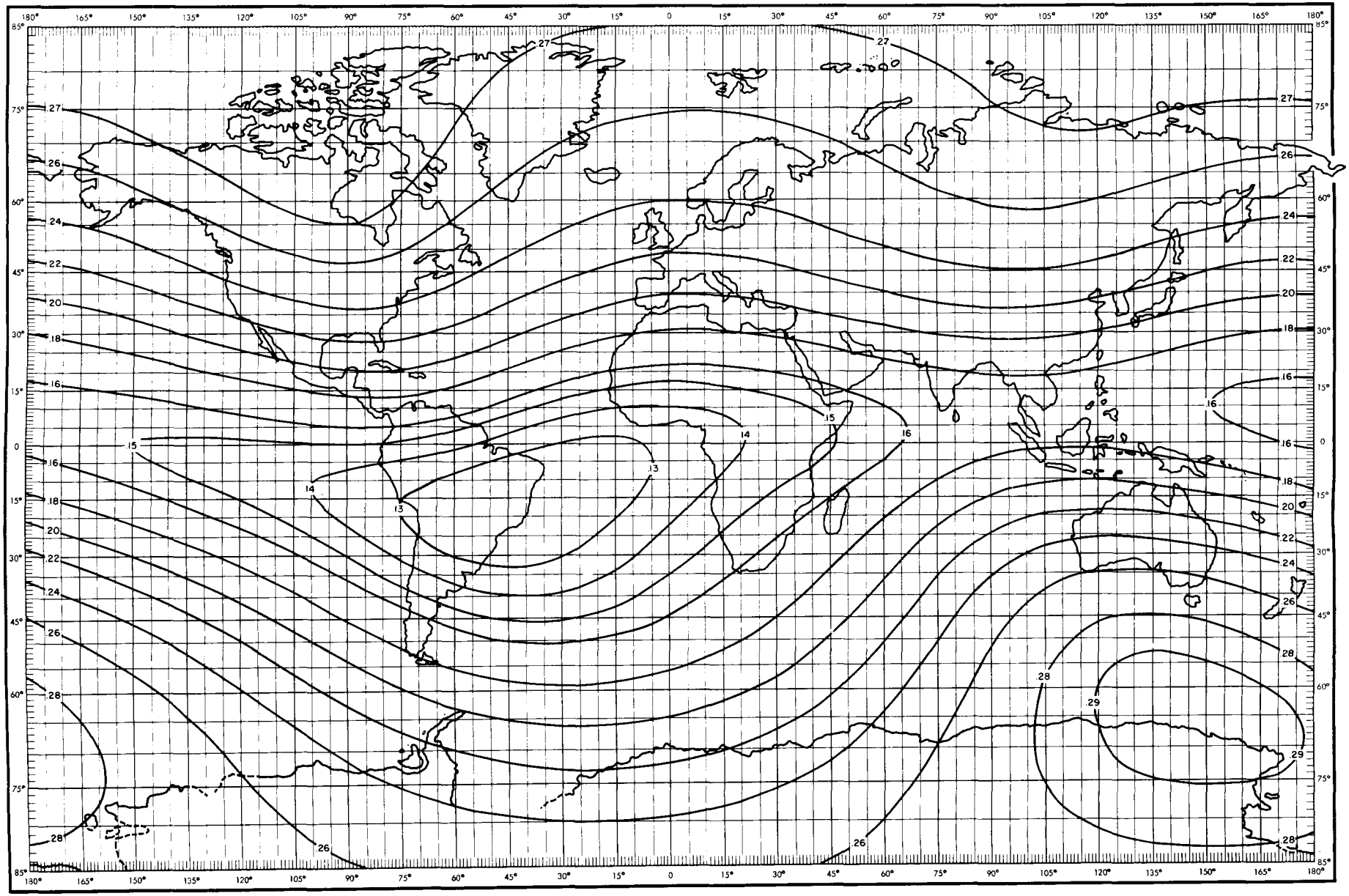

ALTITUDE 1700 KM

LINES OF CONSTANT B (gauss)



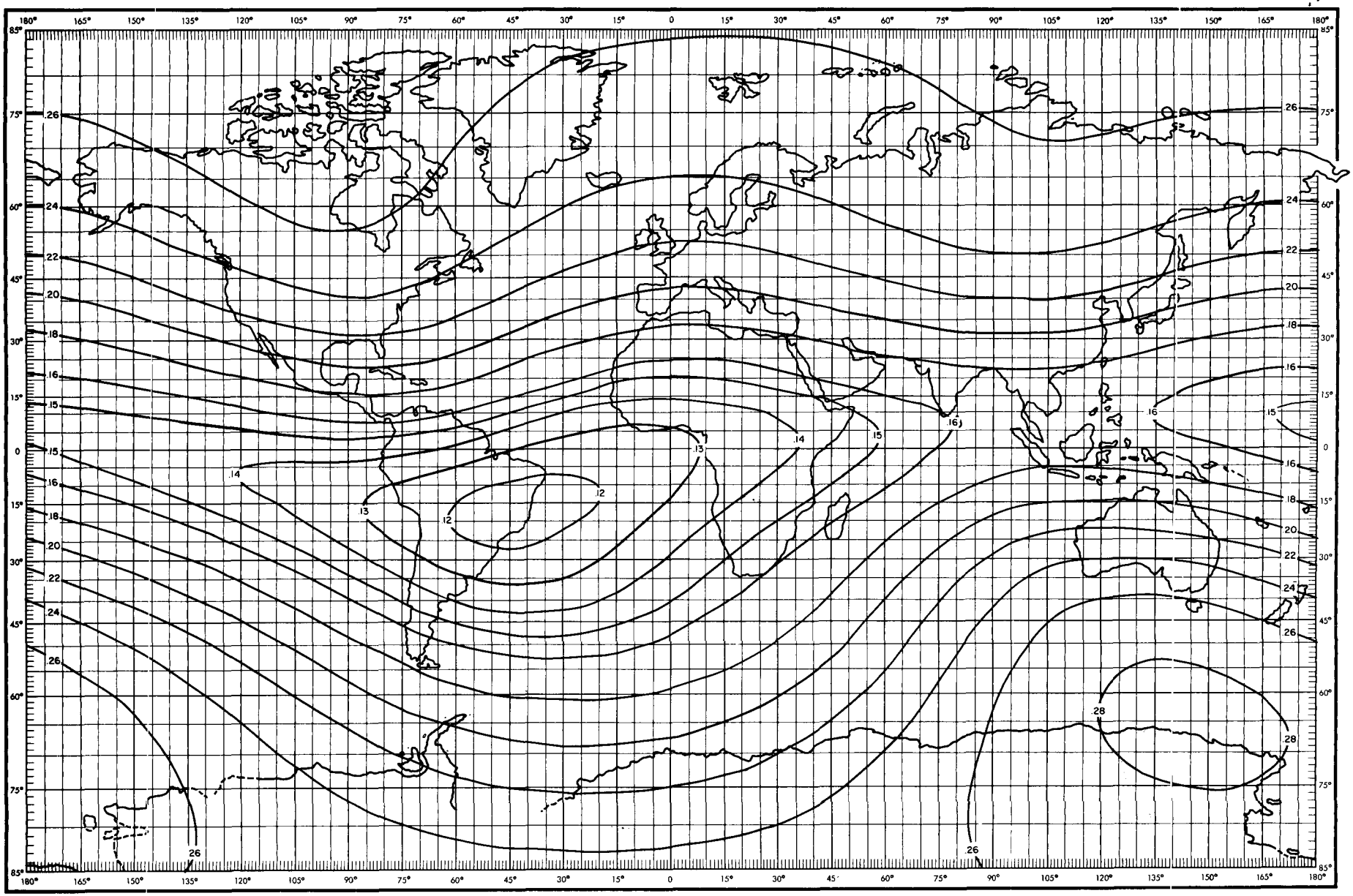

ALTITUDE 1800 KM

# LINES OF CONSTANT B (gauss)



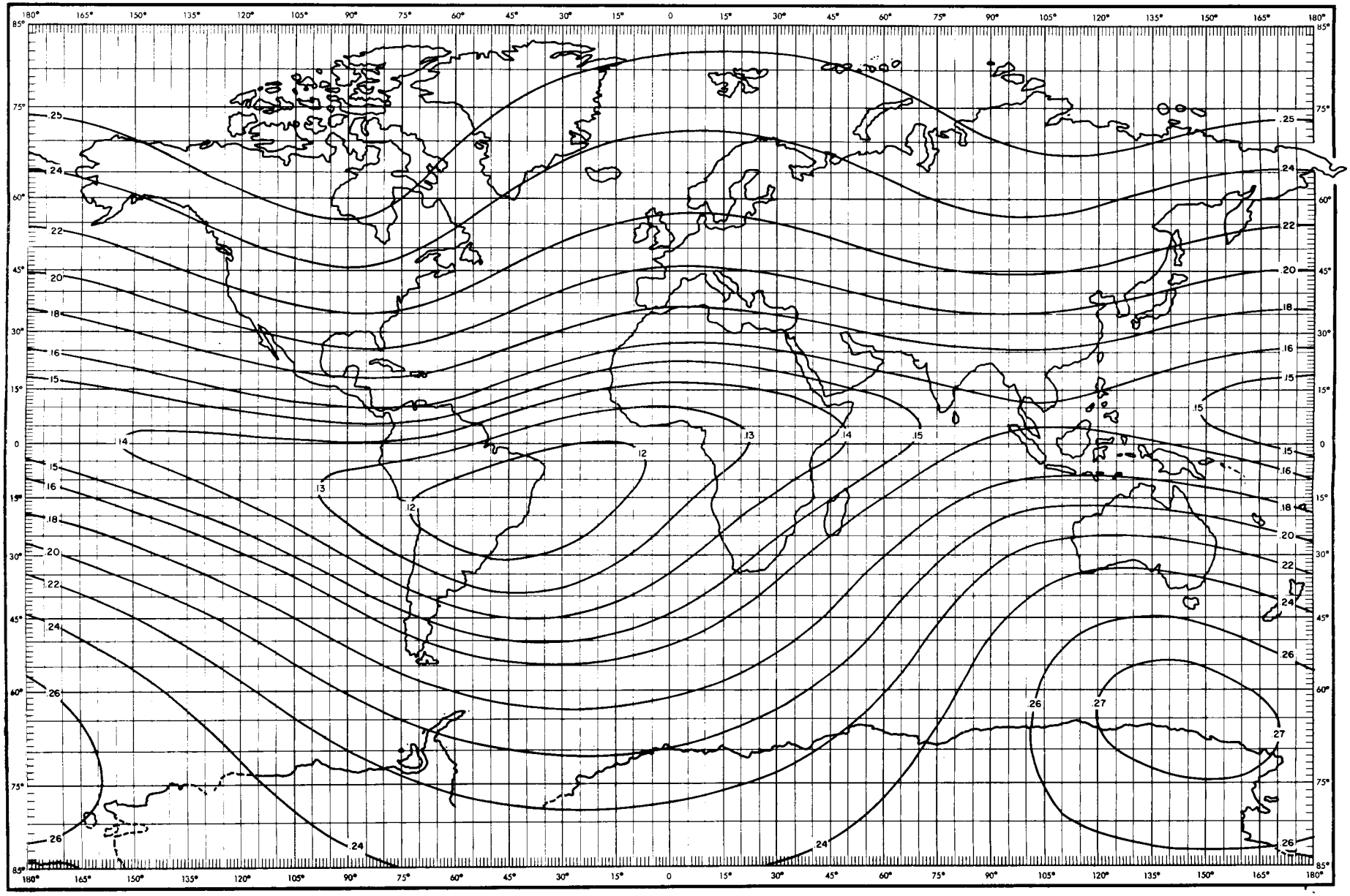

ALTITUDE 1900 KM

## LINES OF CONSTANT B (gauss)



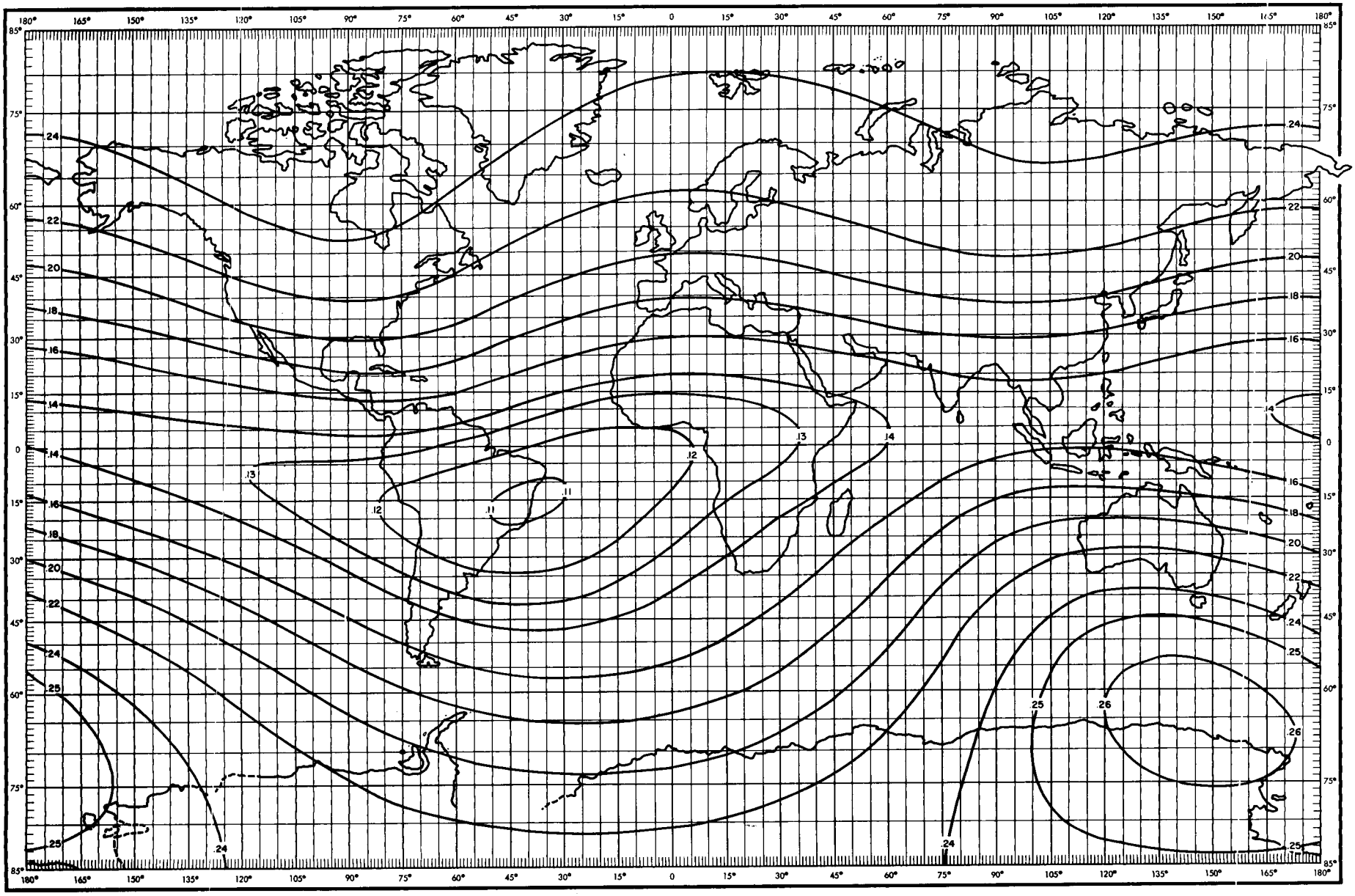

ALTITUDE 2000 KM

LINES OF CONSTANT B (gauss)



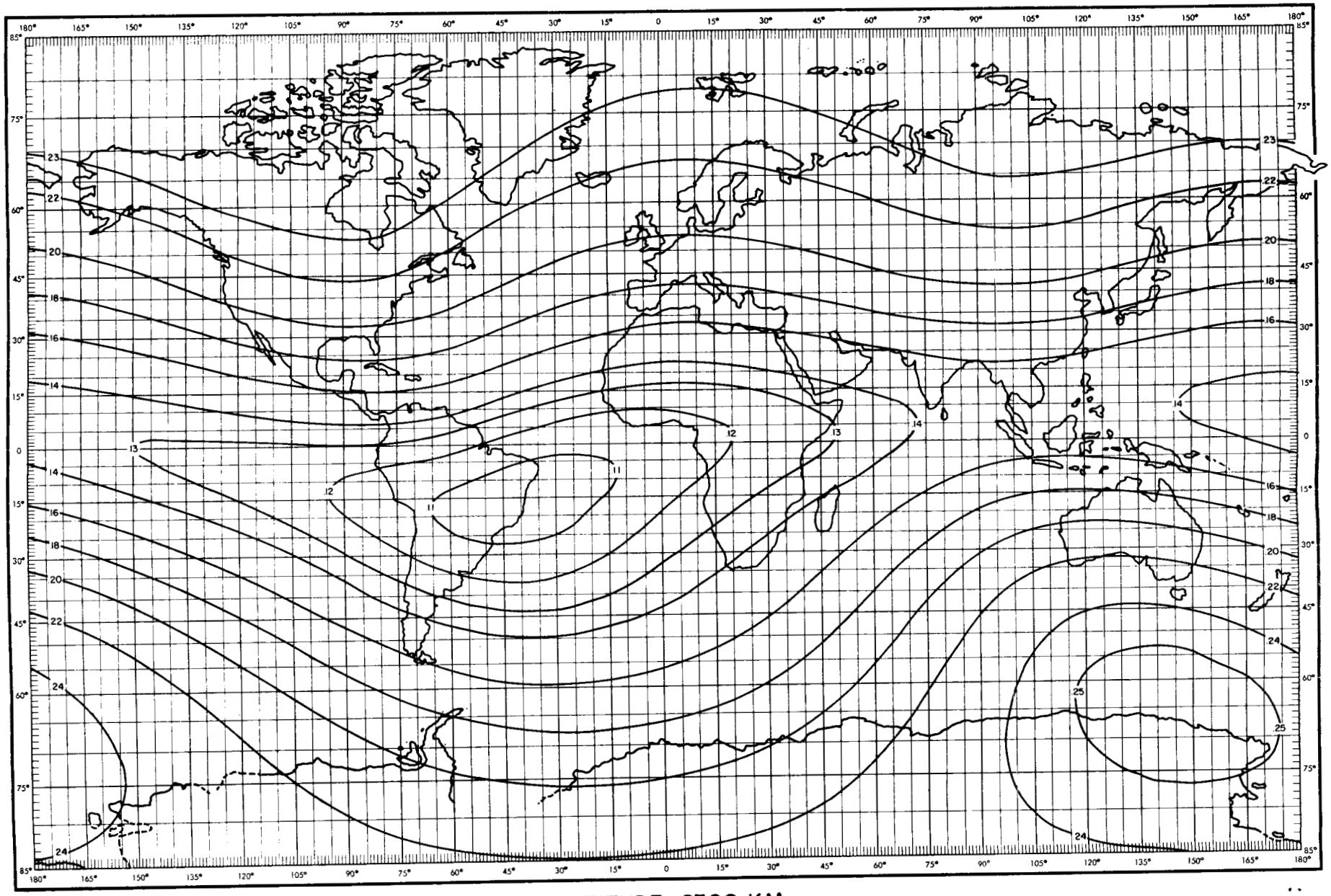

ALTITUDE 2100 KM

LINES OF CONSTANT B (gauss)



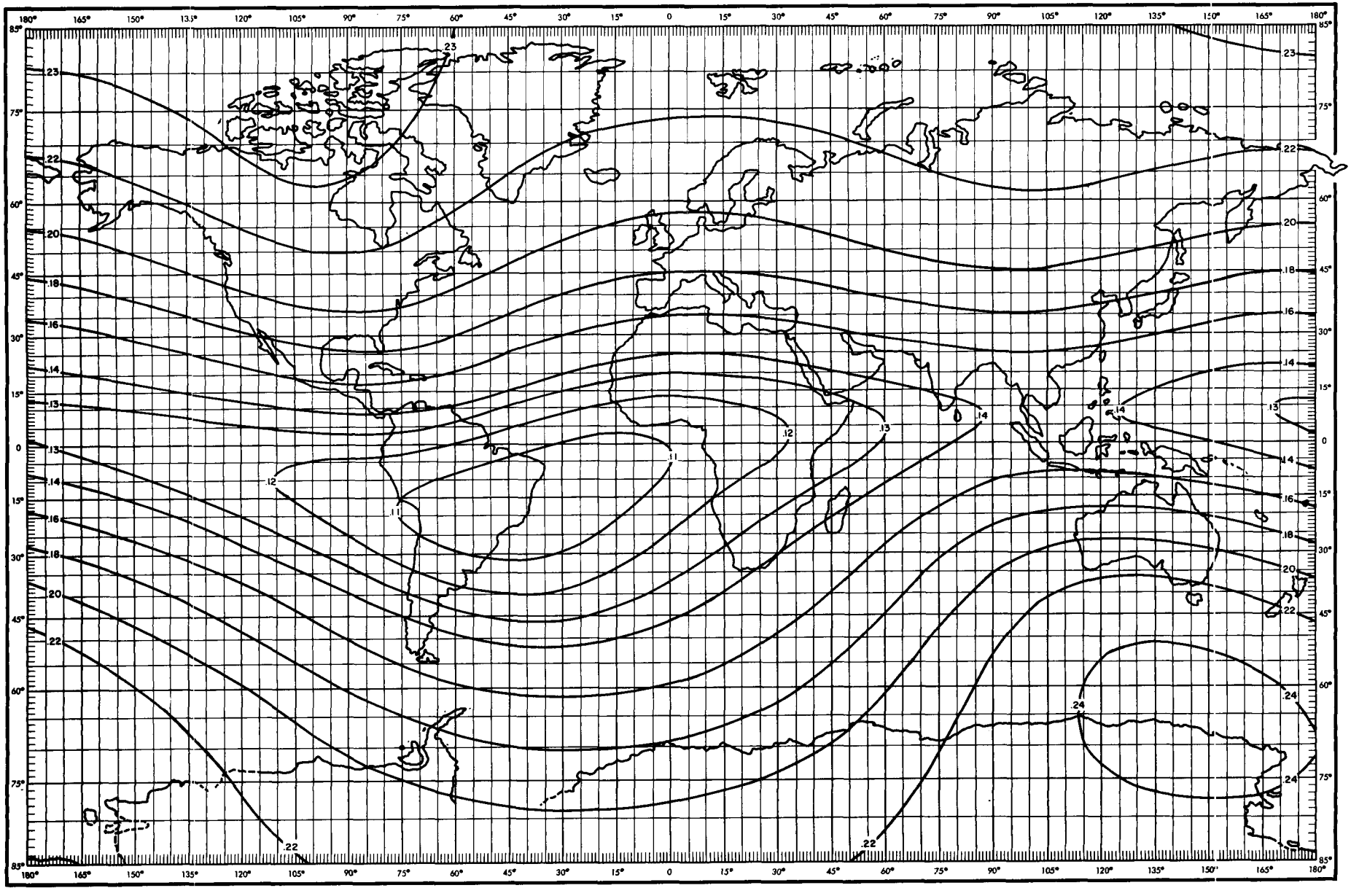

ALTITUDE 2200 KM

# LINES OF CONSTANT B (gauss)



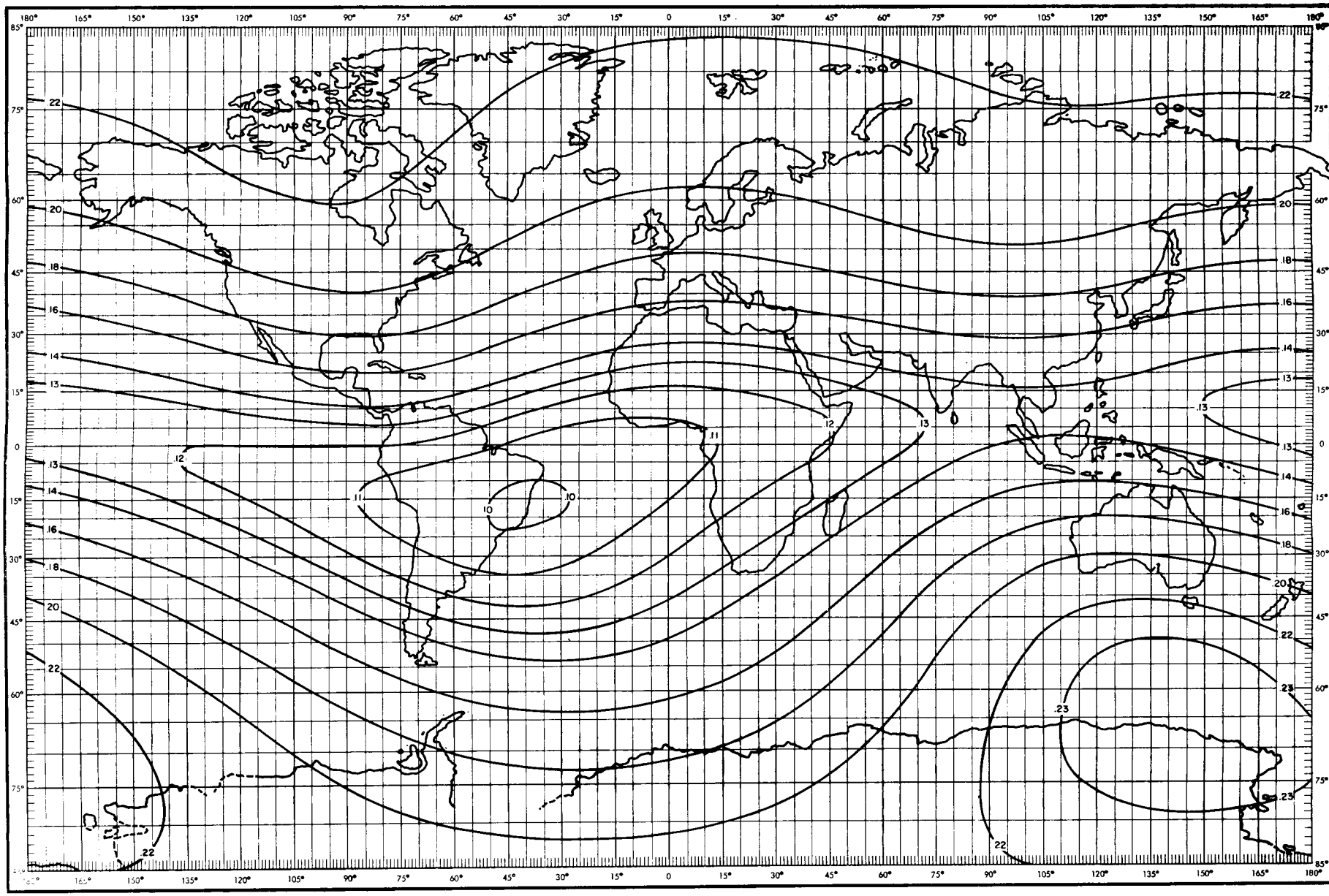

ALTITUDE 2300 KM

LINES OF CONSTANT B (gauss)



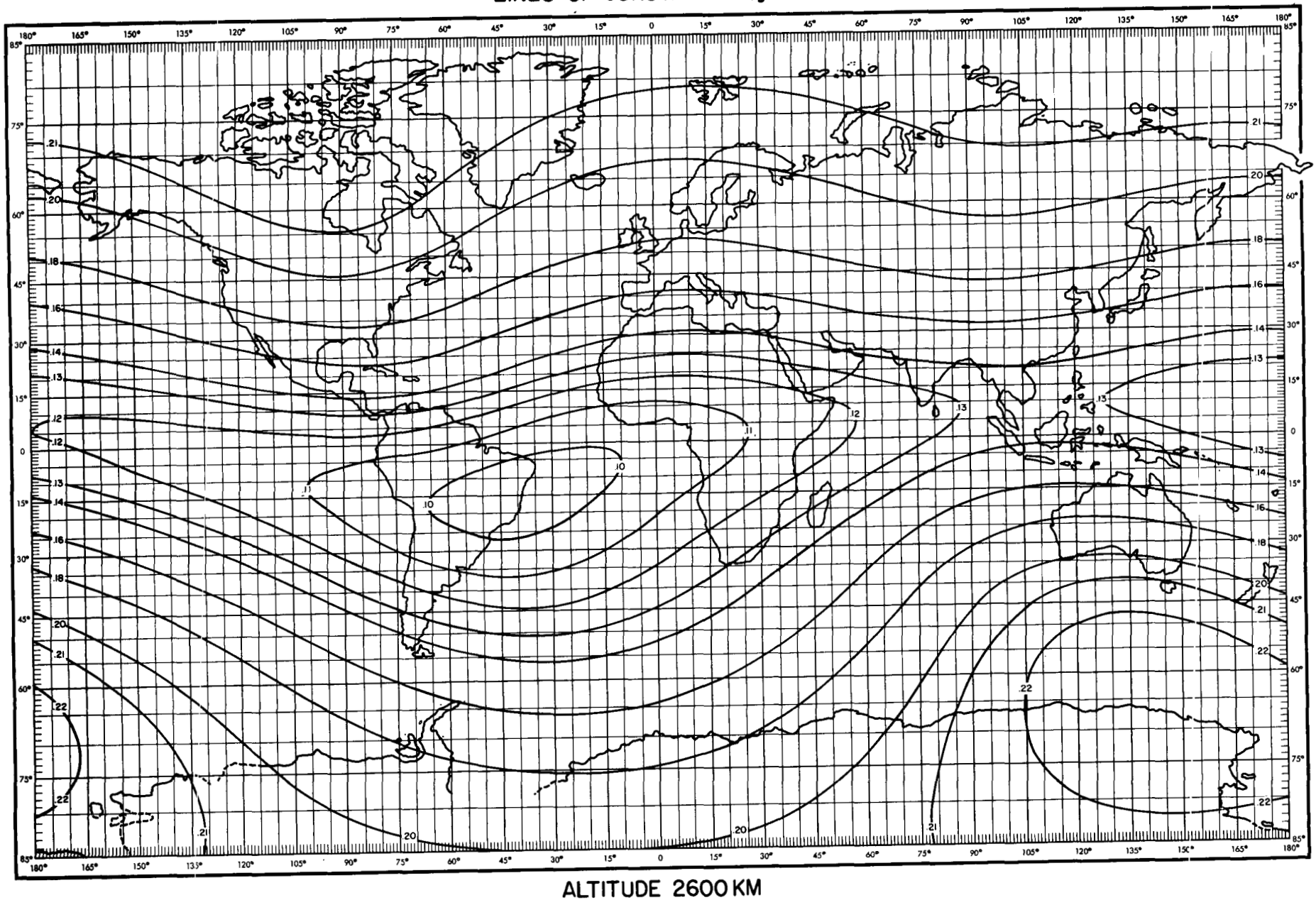
ALTITUDE 2400 KM

LINES OF CONSTANT B (gauss)



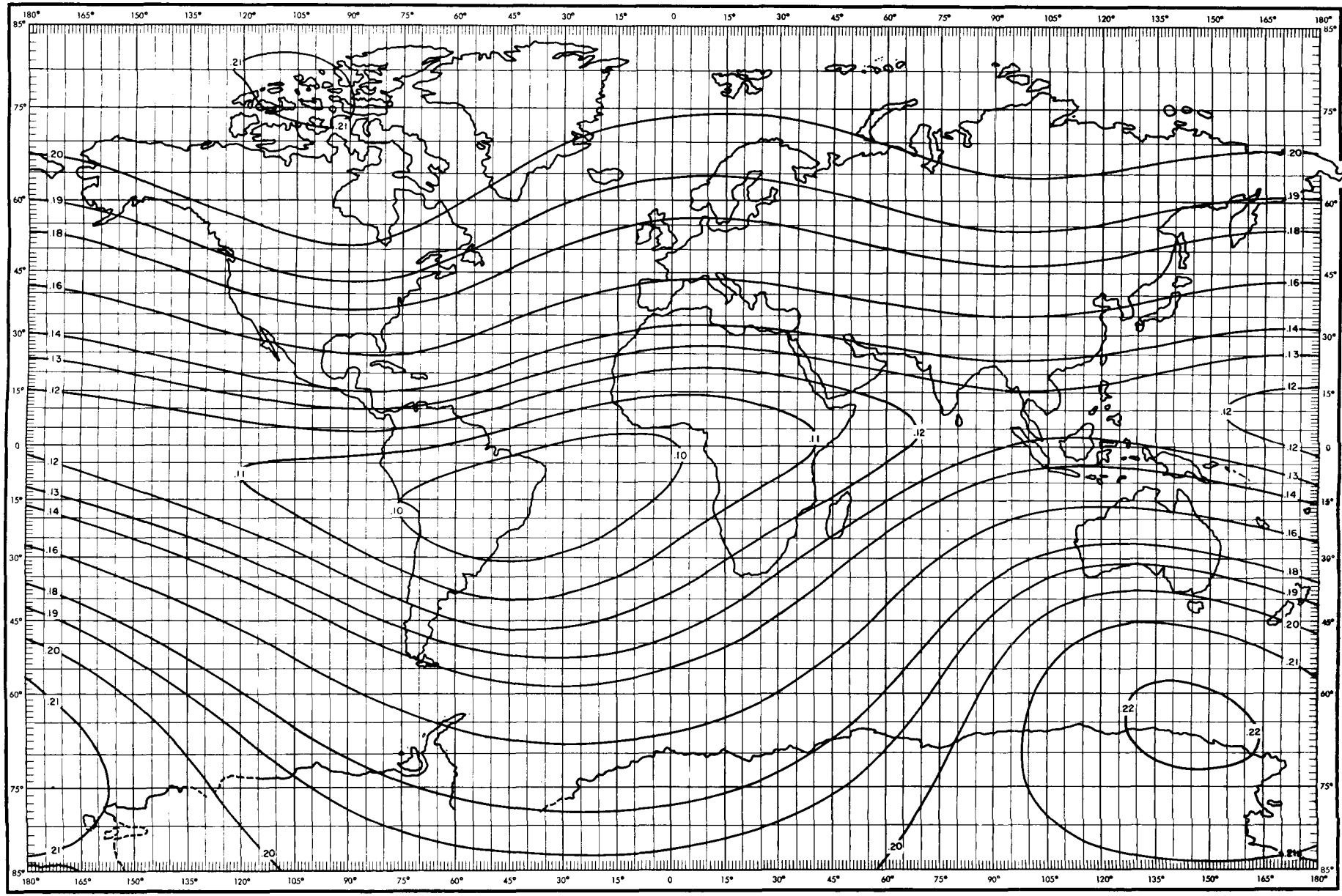

ALTITUDE 2500 KM

## LINES OF CONSTANT B (gauss)



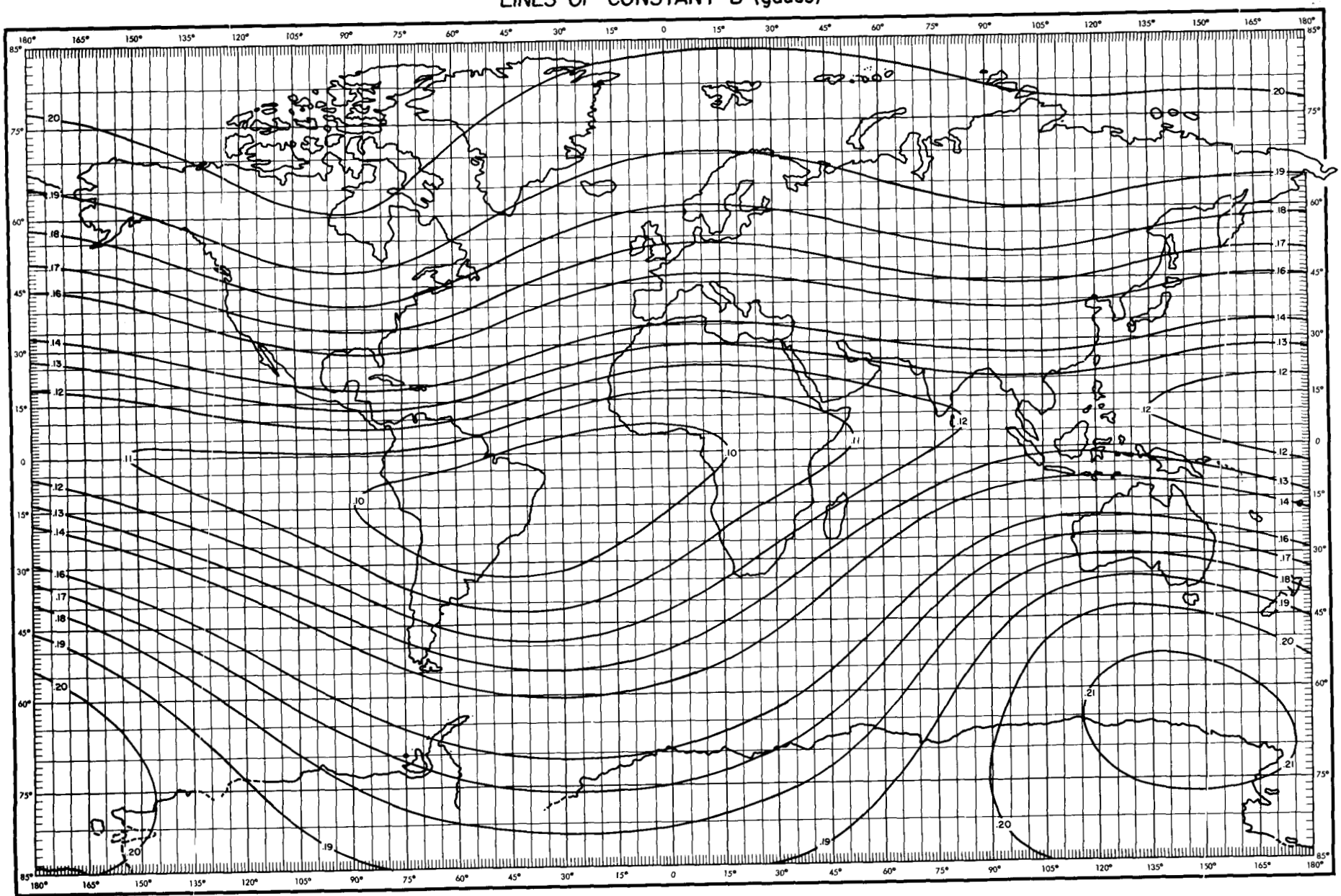

ALTITUDE 2600 KM

LINES OF CONSTANT B (gauss)



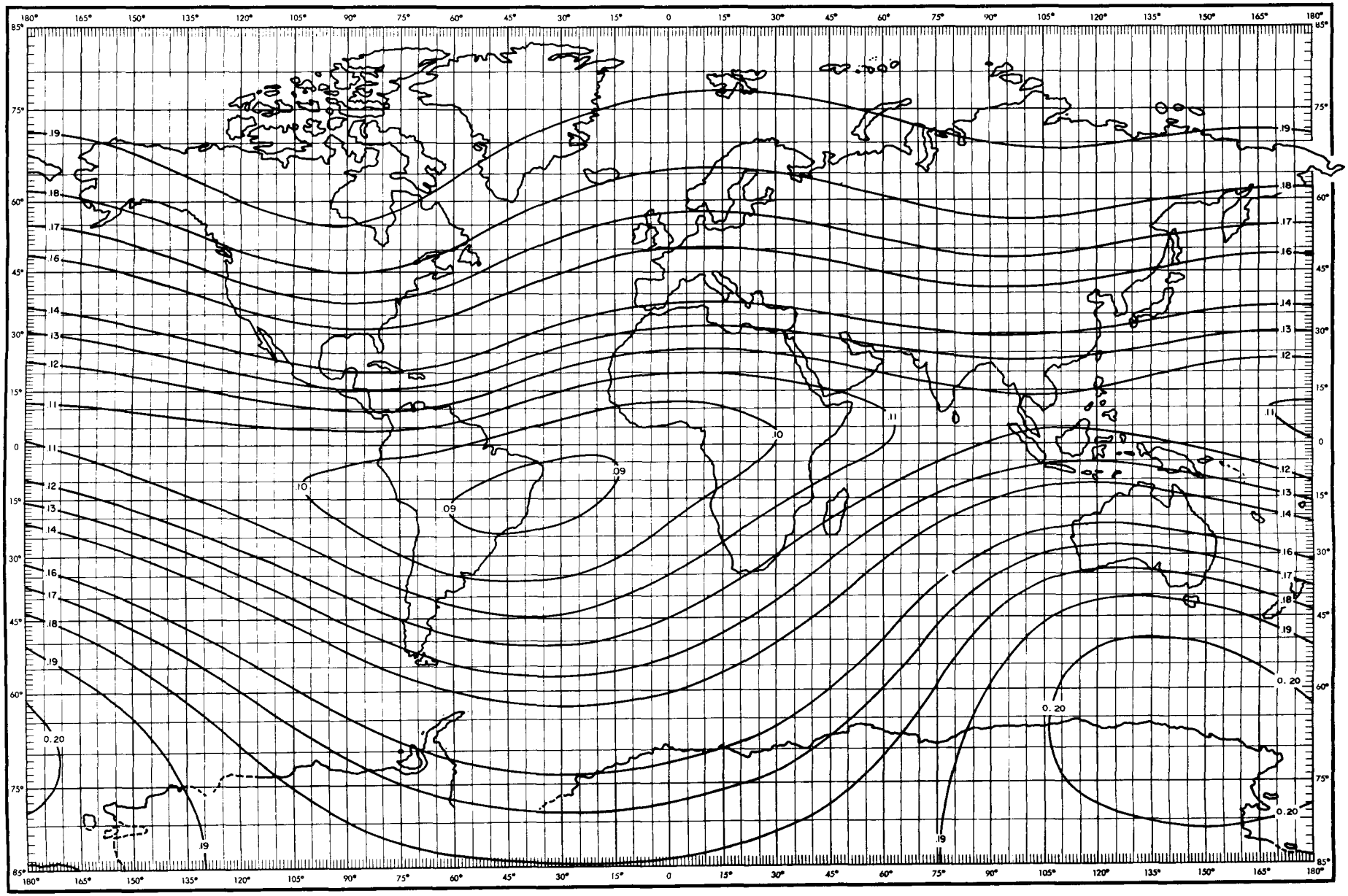
ALTITUDE 2700 KM

LINES OF CONSTANT B (gauss)



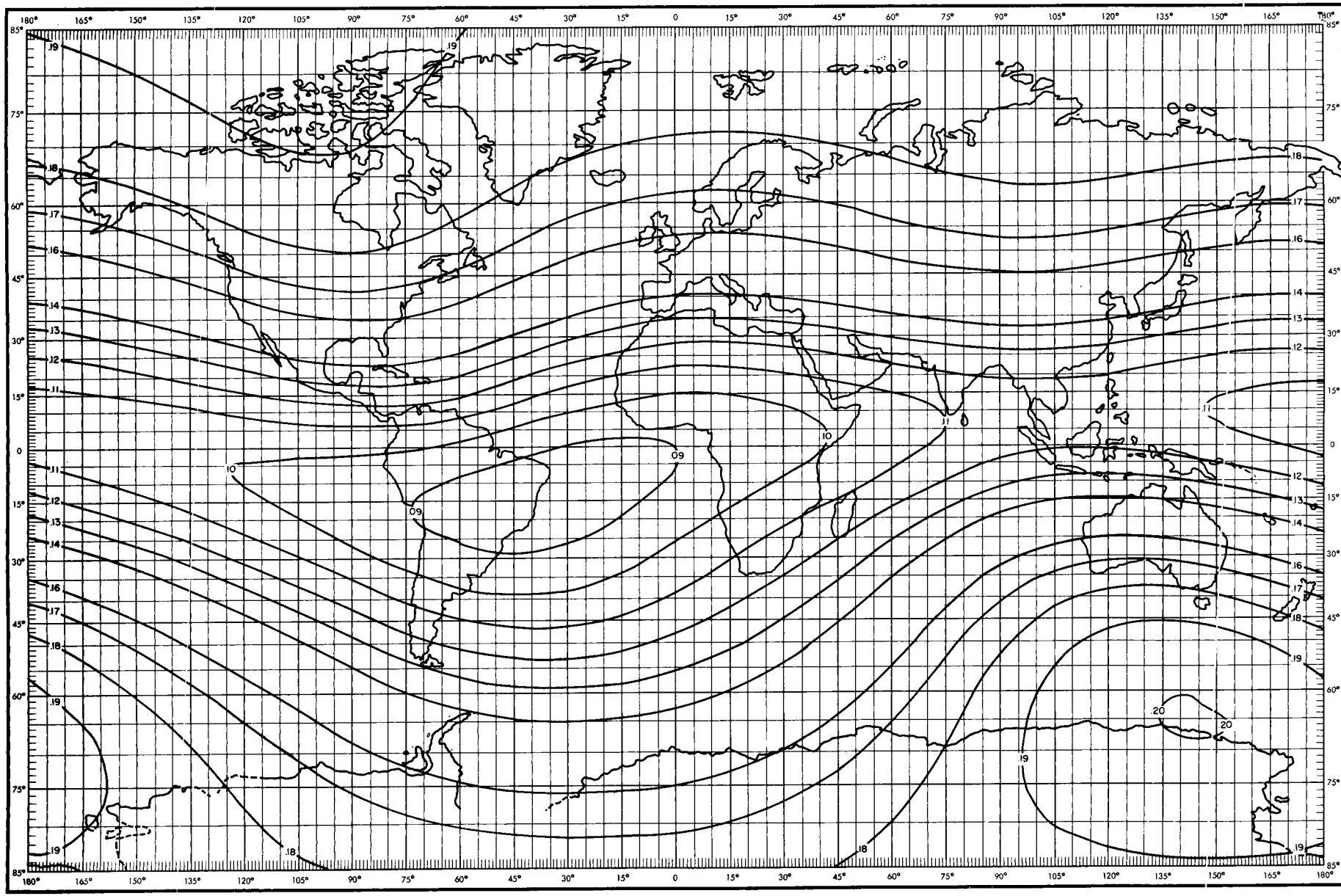
ALTITUDE 2800 KM

LINES OF CONSTANT B (gauss)




ALTITUDE 2900 KM

LINES OF CONSTANT B (gauss)




ALTITUDE 3000